# SERVICE MANUAL

# PARTS LIST

PRIDE IN QUALITY

AKAI SURROUND STEREO TAPE DECK

MODEL 202D-SS

# SURROUND STEREO TAPE DECK

## MODEL 202D-SS

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SECTION 1

# SERVICE MANUAL

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# I. SPECIFICATIONS

**An asterisk next to a figure indicates the minimum guaranteed performance.**

| | | |
|---|---|---|
| TRACK SYSTEM | | 4-track 4-channel stereo system<br>4-track 2-channel stereo system |
| TAPE SPEED | | 7-1/2 ips (19 cm/sec.) ±0.8%<br>3-3/4 ips (9.5 cm/sec.) ±1% |
| WOW AND FLUTTER | | Less than 0.08%(*0.12%) RMS at 7-1/2 ips<br>Less than 0.12%(*0.25%) RMS at 3-3/4 ips |
| TOTAL WOW AND FLUTTER | | Less than 0.18% RMS at 7-1/2 ips<br>(SCOTCH #175 TAPE, 3,000 Hz recording and playback) |
| FREQUENCY RESPONSE | S.R.T. TAPE | 40 to 25,000 Hz±3 dB at 7-1/2 ips<br>40 to 15,000 Hz±3 dB at 3-3/4 ips |
| | REGULAR TAPE | 40 to 22,000 Hz±3 dB at 7-1/2 ips<br>40 to 13,000 Hz±3 dB at 3-3/4 ips |
| TOTAL DISTORTION FACTOR | | Less than 1.5%<br>*Less than 3% at 1,000 Hz O VU recording |
| OUTPUTS | LINE OUTPUT | 1.228V(4±1 dB) at FWD mode, 4±1.5 dB at REV mode, using a 250 Hz O VU pre-recorded tape/7-1/2 ips |
| | DIN OUTPUT | 610 mV(-2 dB), using a 250 Hz pre-recorded tape |
| INPUTS | MIC INPUT | More than 0.5 mV(*0.6 mV) |
| | LINE INPUT | More than 100 mV |
| | DIN INPUT | More than 5 mV(low)<br>More than 100 mV(high) |
| RECORDING PLAYBACK LEVEL | | 1.228V(4±2 dB) at 7-1/2 ips, 1,000 Hz O VU recording |
| S/N RATIO | | Better than 50 dB<br>*Better than 47 dB at 7-1/2 ips<br>*Better than 46 dB at 3-3/4 ips |
| TOTAL S/N RATIO | | Better than 45 dB at 7-1/2 ips |
| CROSS TALK | | Better than 43 dB(*40 dB) at 1,000 Hz 3 VU recording |
| ERASE RATIO | | Better than 70 dB |
| RECORDING BIAS FREQUENCY | | 82±5 kHz |
| BIAS LEAK | | Less than -30 VU (4 channel)<br>Less than -20 VU (2 channel) |
| REVERSING TIME | | 2 to 3 seconds |
| RECORDING CAPACITY | | 45 min. 4 channel stereo recording, using a 1,800 ft. tape at 7-1/2 ips |
| F. FWD AND RWD TIME | | 110/90 sec., using a 1,800 ft. tape at 50/60 Hz |
| MOTORS | CAPSTAN MOTOR | 2 speed Hysteresis Synchronous Motor<br>Type: HM2-16MC (winterized) 4-8 pole<br>Revolutions: 1,500/1,800 r.p.m. at 50/60 Hz<br>750/900 r.p.m. at 50/60 Hz |
| | REEL MOTORS | Two 6-pole eddy current outer rotor motors<br>Type: 24XO-MR<br>Revolutions: 930/1,120 r.p.m. at 50/60 Hz |
| HEADS | FULL TRACK ERASE HEAD | Type: EF-210<br>Gap: 0.2 mm W Gap<br>Impedance: 360Ω±10% at 100 kHz<br>D.C. Resistance: 2.8Ω |
| | 4 TRACK ERASE HEAD | Type: E4-260<br>Gap: 0.2 mm W Gap<br>Impedance: 195Ω±10% at 100 kHz<br>D.C. Resistance: 1.6Ω |
| | 4 TRACK RECORDING/PLAYBACK HEAD | Type: P4-50<br>Gap: 2 microns<br>Impedance: 1,200Ω±15% at 1 kHz<br>D.C. Resistance: 160Ω |
| TRANSISTORS | | 2SC711(E)(F) . . . 19 / 2SC1098(L) . . . 1 / 2SC1312(G)(H) . . . 16 |
| DIODES | | 1N34A . . . 5 / 1S2473VE . . . 10 / 10D05 . . . 4<br>10D2 . . . 1 / 10D4 . . . 1 / WZ713 . . . 1 |
| ZENER DIODES | | WZ240 . . . 1 / YZ088A . . . 4 |
| POWER SUPPLY | | 100 to 240V A.C. 50/60 Hz |
| POWER CONSUMPTION | | 100W |
| DIMENSIONS | | 391(W) x 442 (H) x 231 (D) mm (15.4" x 17.4" x 9.1") |
| WEIGHT | | 18 kg (39.6 lbs.) |

**NOTE: Specifications subject to change without notice.**

# II. MEASURING METHOD

## 1. TAPE SPEED DEVIATION

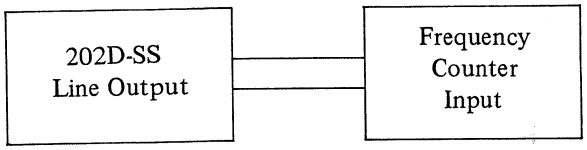



Fig. 1

As shown in Fig. 1, connect a Frequency Counter to the Line Output. Playback a 1,000 Hz pre-recorded test tape. Take a frequency counter reading at the beginning, middle, and end of tape winding during playback. The maximum value of these respective readings will represent tape speed deviation.

## 2. WOW AND FLUTTER

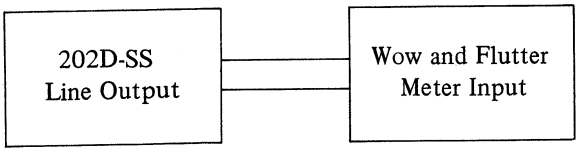



Fig. 2

**Method A**

As shown in Fig. 2, connect the Line output to the Input of a Wow and Flutter Meter. Playback a 3,000 Hz pre-recorded test tape and take a wow and flutter meter reading at the beginning, middle, and end of tape winding. The maximum value of these respective readings will represent the wow and flutter.

**Method B**

Supply a 3,000 Hz sine wave signal from an Audio Frequency Oscillator and make a recording on a blank tape at the beginning, middle, and end of tape winding. Rewind and playback the resultant signals. Measure wow and flutter with a Wow and Flutter Meter. (The wow and flutter value of Method B will be close to twice that of Method A.)

## 3. FREQUENCY RESPONSE

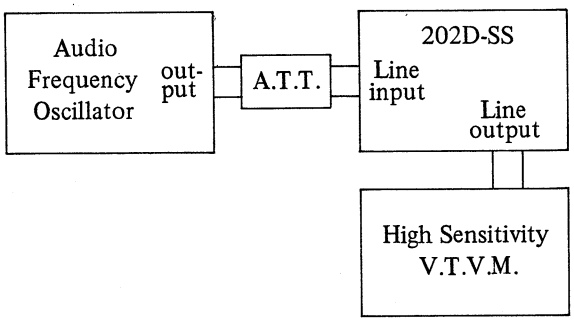



Fig. 3

For measuring frequency response, connect instruments as shown in Fig. 3 and proceed as follows:

1) Supply a 2,000 Hz sine wave signal to the Line input from an Audio Frequency Oscillator through an Attenuator.
2) Set tape deck to recording mode and turn recording level control volume to maximum. Adjust attenuator to obtain a +4 dB V.T.V.M. reading.
3) Under conditions described in 2) above, re-adjust attenuator so that the Line output is -16 dB, and record 30 to 23,000 Hz at 7-1/2 ips spot frequencies.
4) Rewind the tape and playback from the beginning. Take V.T.V.M. spot frequency readings and plot values on a graph.

NOTE: When measuring frequency response, new tape should be used.

## 4. SIGNAL TO NOISE RATIO

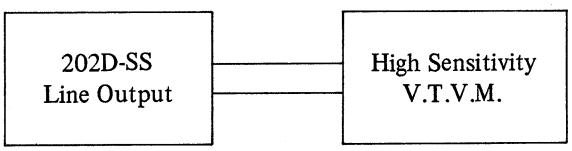



Fig. 4

As shown in Fig. 4, connect a High Sensitivity V.T.V.M. to the Line output. Playback a 250 Hz "O" VU pre-recorded test tape and measure the output. Then remove the tape and measure the noise level under the same condition. Convert each of the measured values into decibels.

## 5. TOTAL HARMONIC DISTORTION FACTOR

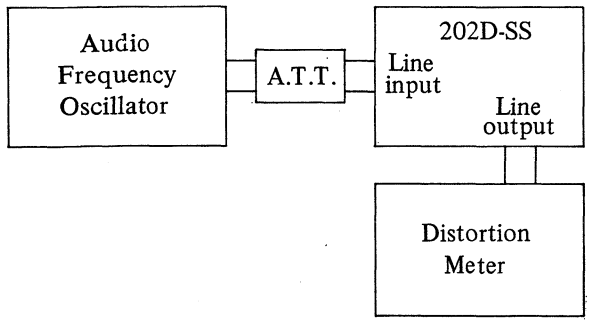



Fig. 5

Connect the measuring instruments as shown in Fig. 5 and record a 1,000 Hz sine wave signal at "O" VU. Playback the resultant signal and measure the overall distortion factor. Measure the noise level of the tape recorder without the tape. Connect the audio frequency oscillator directly to the distortion meter for measurement of the distortion factor of the oscillator. The required distortion factor can be obtained from the results of the above measurement by the following formula:

$$d_0 = d - d_1 - d_2$$

where, $d_0$ = Required distortion factor
$d$ = Overall distortion factor
$d_1$ = Noise Level
$d_2$ = Distortion factor of the oscillator

NOTE: When measuring the distortion factor, new tape should be used.

## 6. CROSS TALK (Cross talk between the channels)

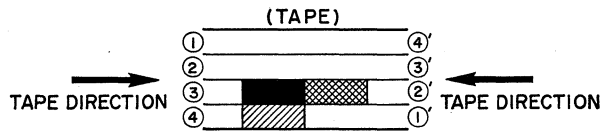



Fig. 6

As shown in Fig. 6, first record a 1,000 Hz sine wave signal on Track No. 3 at +3 VU level. Next, record under a non-input condition. Then, playback the tape on Tracks No. 3 and 4 (reversed condition of tape) through the B.P.F. (band pass filter, Sensitivity ... 1:1) and obtain a ratio between the two from the following formula:

$$C = 20 \log \frac{E_0}{E_2 - E_1} \text{ (dB)}$$

where, $C$ = Desired cross talk ratio (dB)
$E_0$ = 1,000 Hz signal output level
$E_2$ = 1,000 Hz cross talk level
$E_1$ = Non-input signal recorded level

## 7. ERASE RATIO

As shown in Fig. 4, connect a High Sensitivity V.T.V.M. to the Line output. Playback a virgin tape and take a V.T.V.M. reading of the output level. Next, record a 1,000 Hz sine wave signal at +3 VU, then playback this recorded signal and take a V.T.V.M. reading of the output level. Next, using this pre-recorded tape, record under a non-input condition and take a reading of the noise level output of the erased signal and obtain a ratio between the two from the following formula:

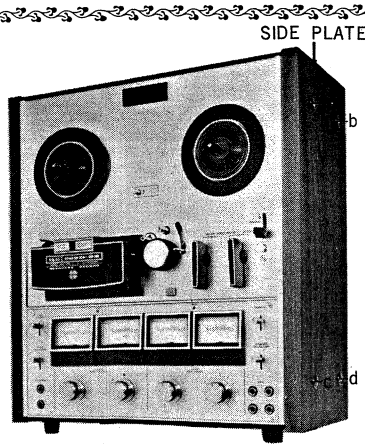
$$E_r = 20 \log \frac{E_0}{E_2 - E_1} \text{ (dB)}$$

where, $E_r$ = Desired erase ratio (dB)
$E_0$ = 1,000 Hz signal output level
$E_2$ = Non-input signal recorded level
$E_1$ = Virgin tape noise output level

# III. DISMANTLING OF UNIT

In case of trouble, etc. necessitating disassembly, please disassemble in the order shown in photographs. Reassemble in reverse order.

1

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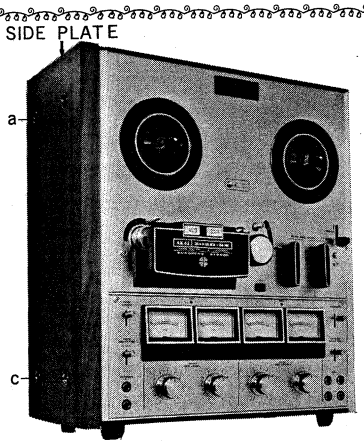


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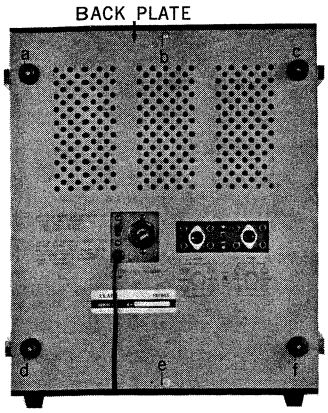


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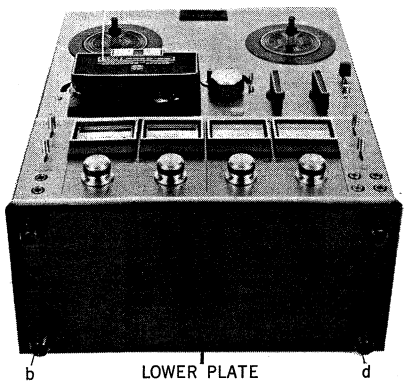
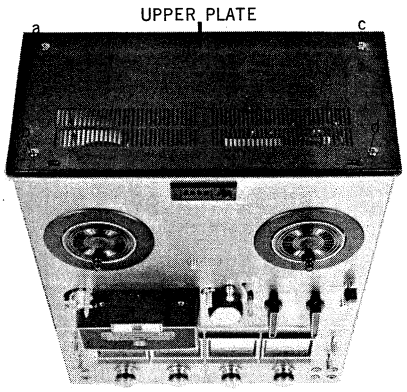
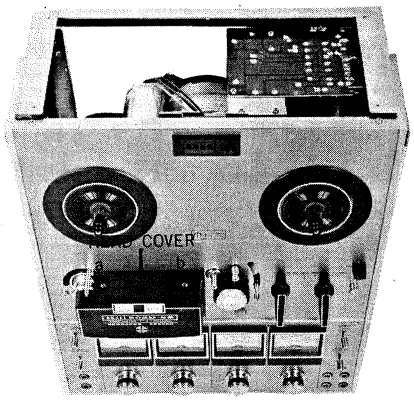



5




6

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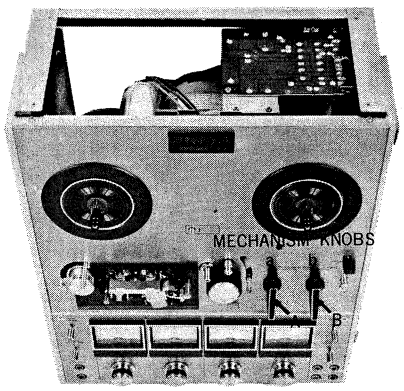
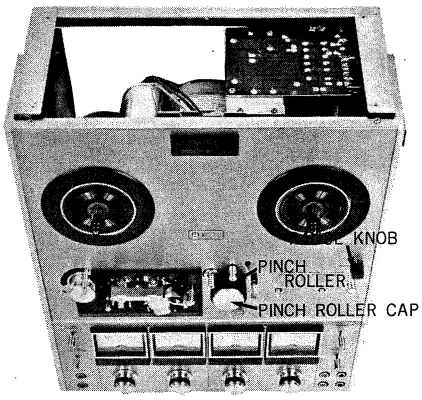
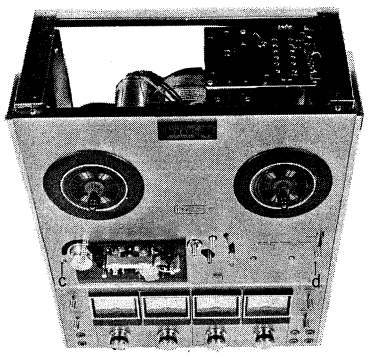



8

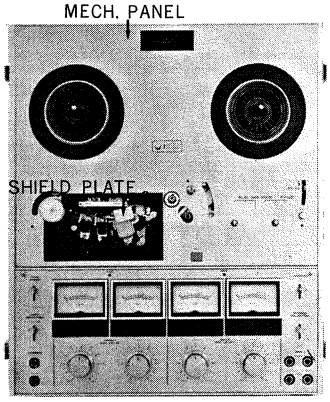


9

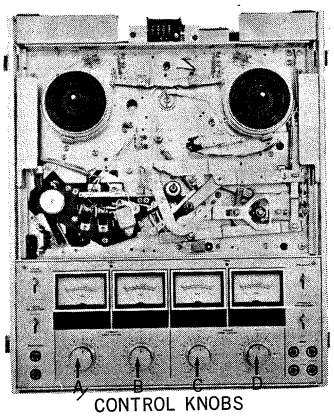



SCREWS

10

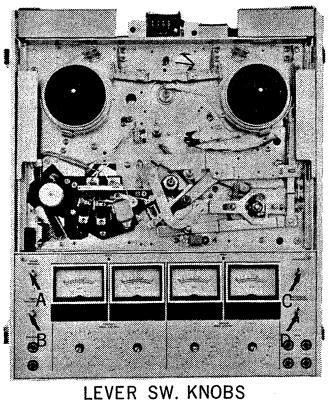



11



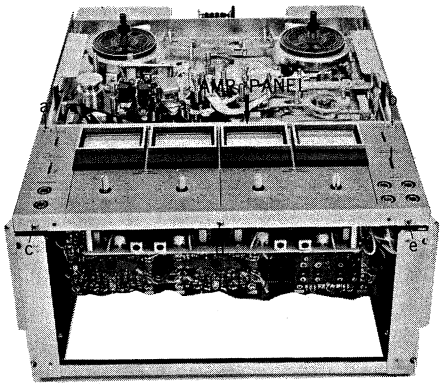

CONTROL KNOBS

12

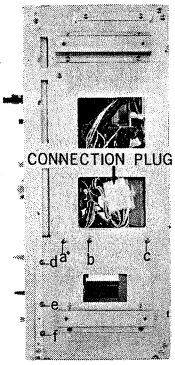



LEVER SW. KNOBS

13

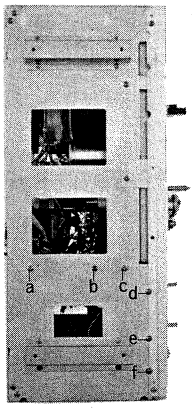



14



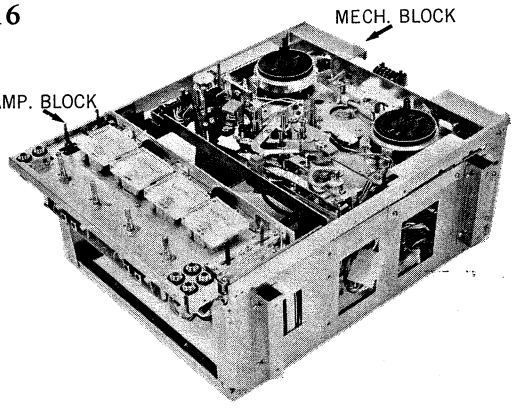

SCREWS

15

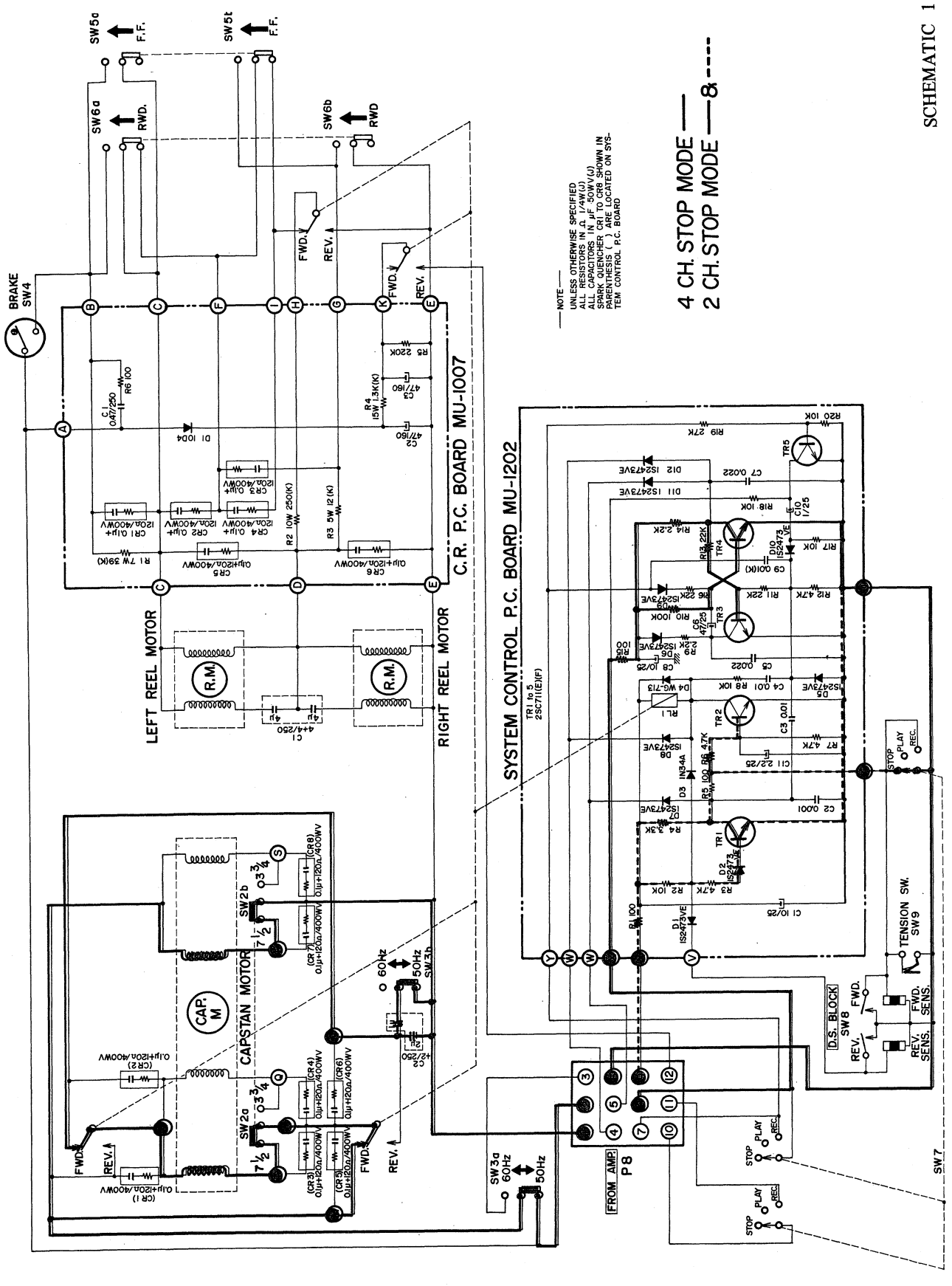


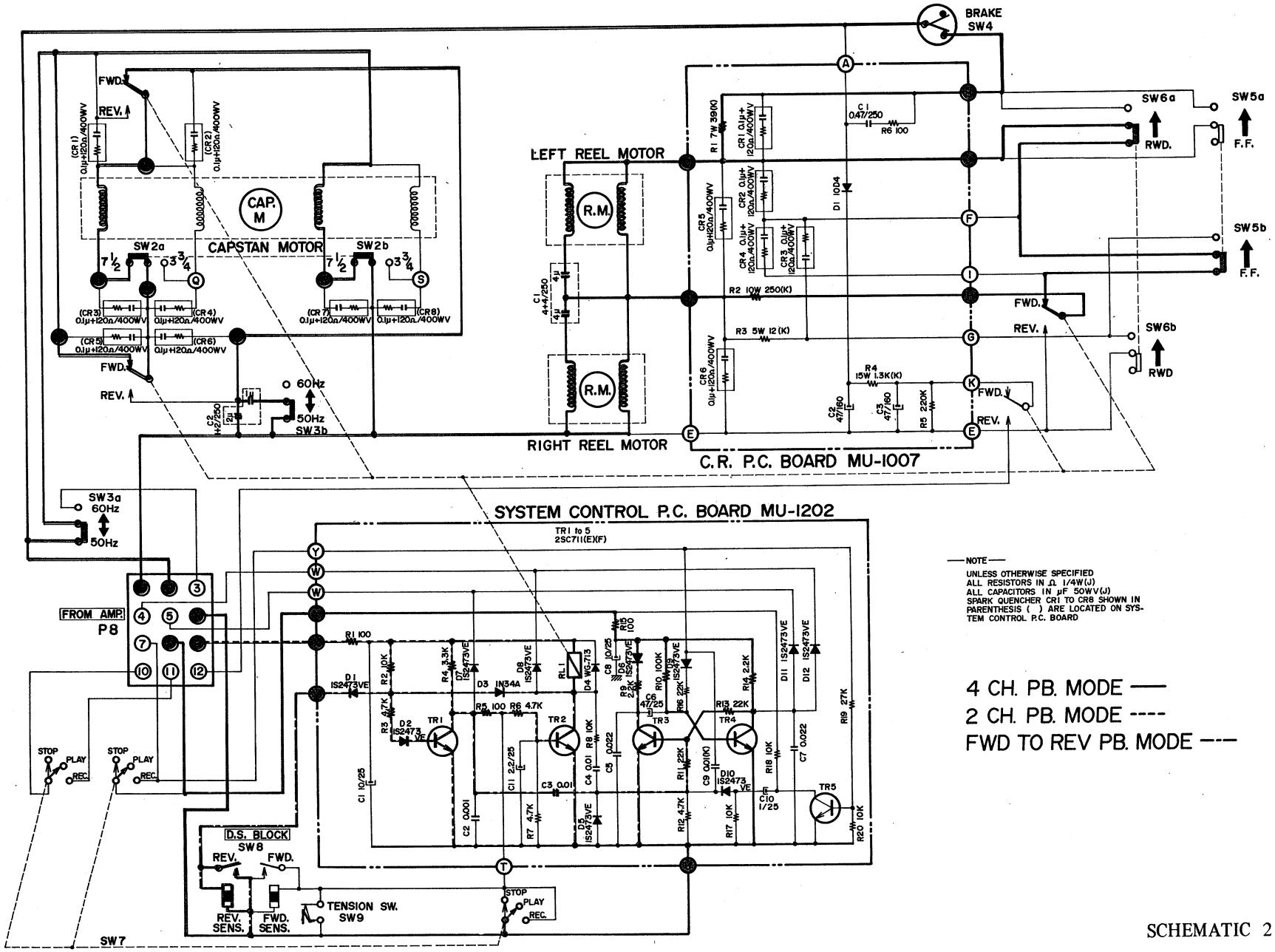

SCREWS

16

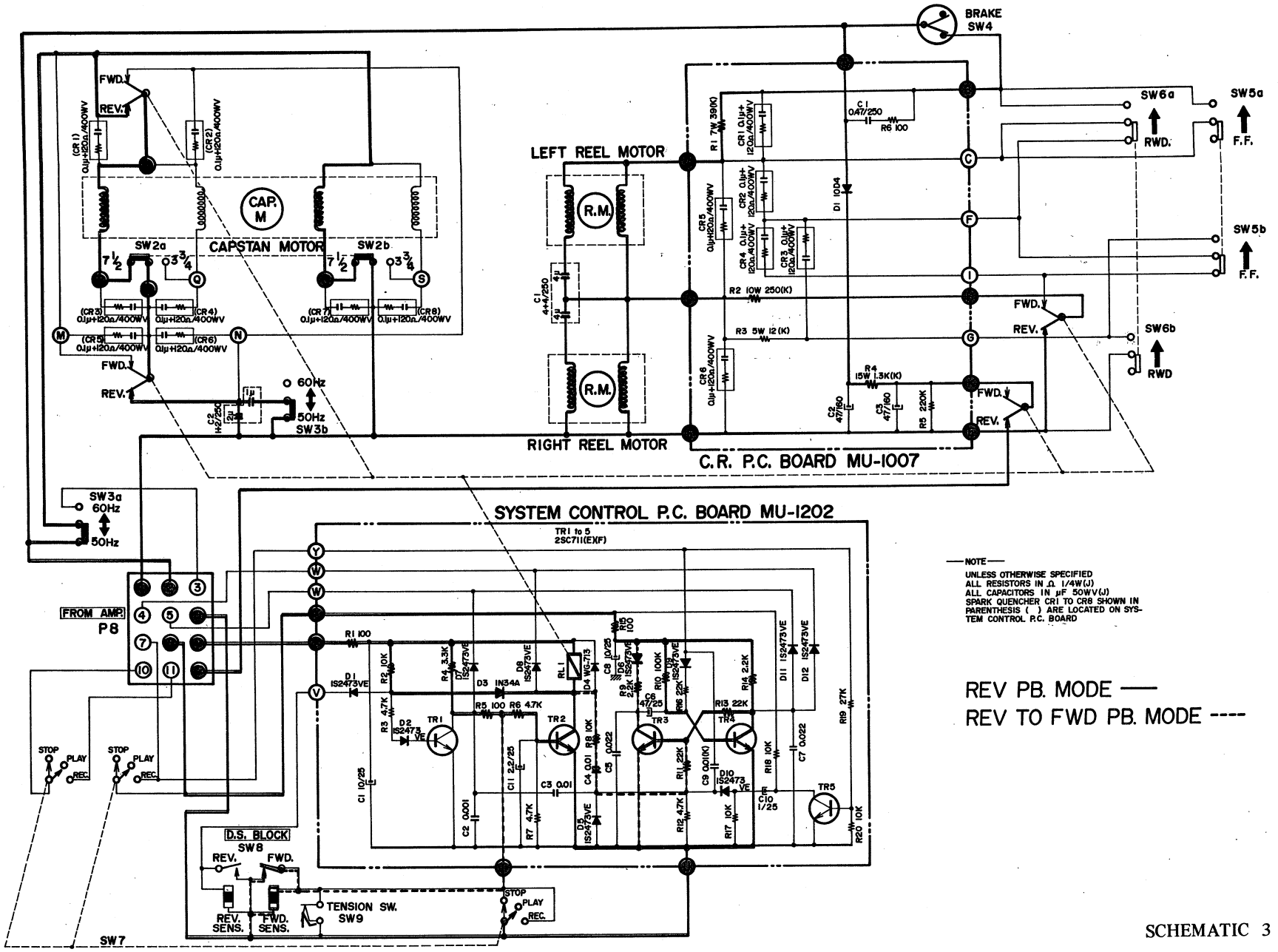


# IV. SYSTEM CONTROL CIRCUIT OPERATION




BRAKE SW4
LEFT REEL MOTOR
RIGHT REEL MOTOR
R.M.
CAP. M
CAPSTAN MOTOR
SW2a
SW2b
FWD.
REV.
60Hz
50Hz
SW3b
SW6a
SW5a
SW5b
SW6b
RWD.
F.F.
C.R. P.C. BOARD MU-1007
SW3a
SYSTEM CONTROL P.C. BOARD MU-1202
TR1 to 5
2SC711(E)(F)
FROM AMP.
P8
STOP
PLAY
REC.
D.S. BLOCK
SW8
REV. SENS.
FWD. SENS.
TENSION SW.
SW9
SW7
NOTE
UNLESS OTHERWISE SPECIFIED
ALL RESISTORS IN Ω 1/4W(J)
ALL CAPACITORS IN μF 50WV(J)
SPARK QUENCHER CR1 TO CR8 SHOWN IN PARENTHESIS ( ) ARE LOCATED ON SYSTEM CONTROL P.C. BOARD
4 CH. PB. MODE
2 CH. PB. MODE
FWD TO REV PB. MODE

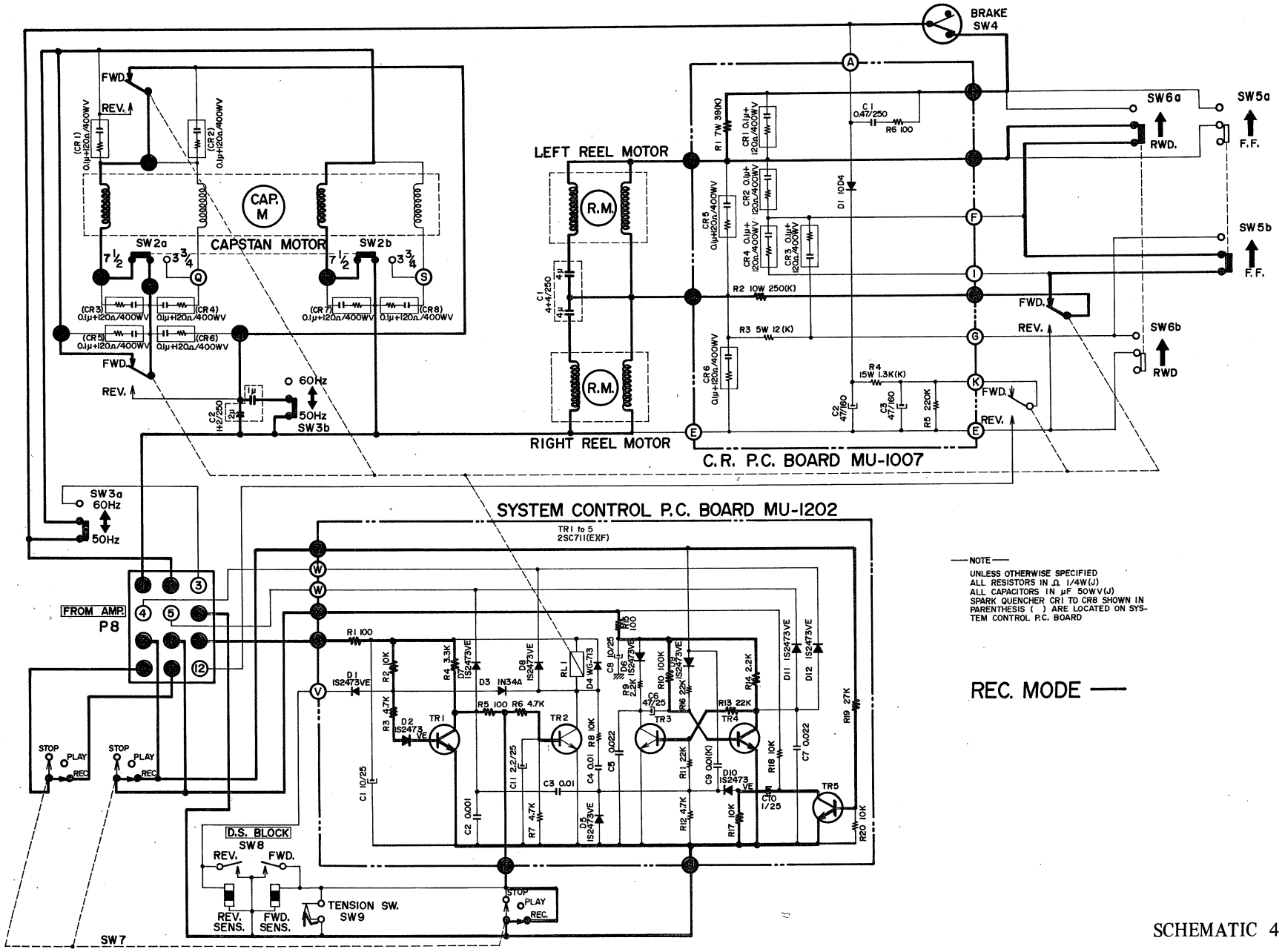
SCHEMATIC 2




NOTE
UNLESS OTHERWISE SPECIFIED
ALL RESISTORS IN Ω 1/4W(J)
ALL CAPACITORS IN μF 50WV(J)
SPARK QUENCHER CR1 TO CR8 SHOWN IN PARENTHESIS ( ) ARE LOCATED ON SYSTEM CONTROL P.C. BOARD

REV PB. MODE ——
REV TO FWD PB. MODE ----

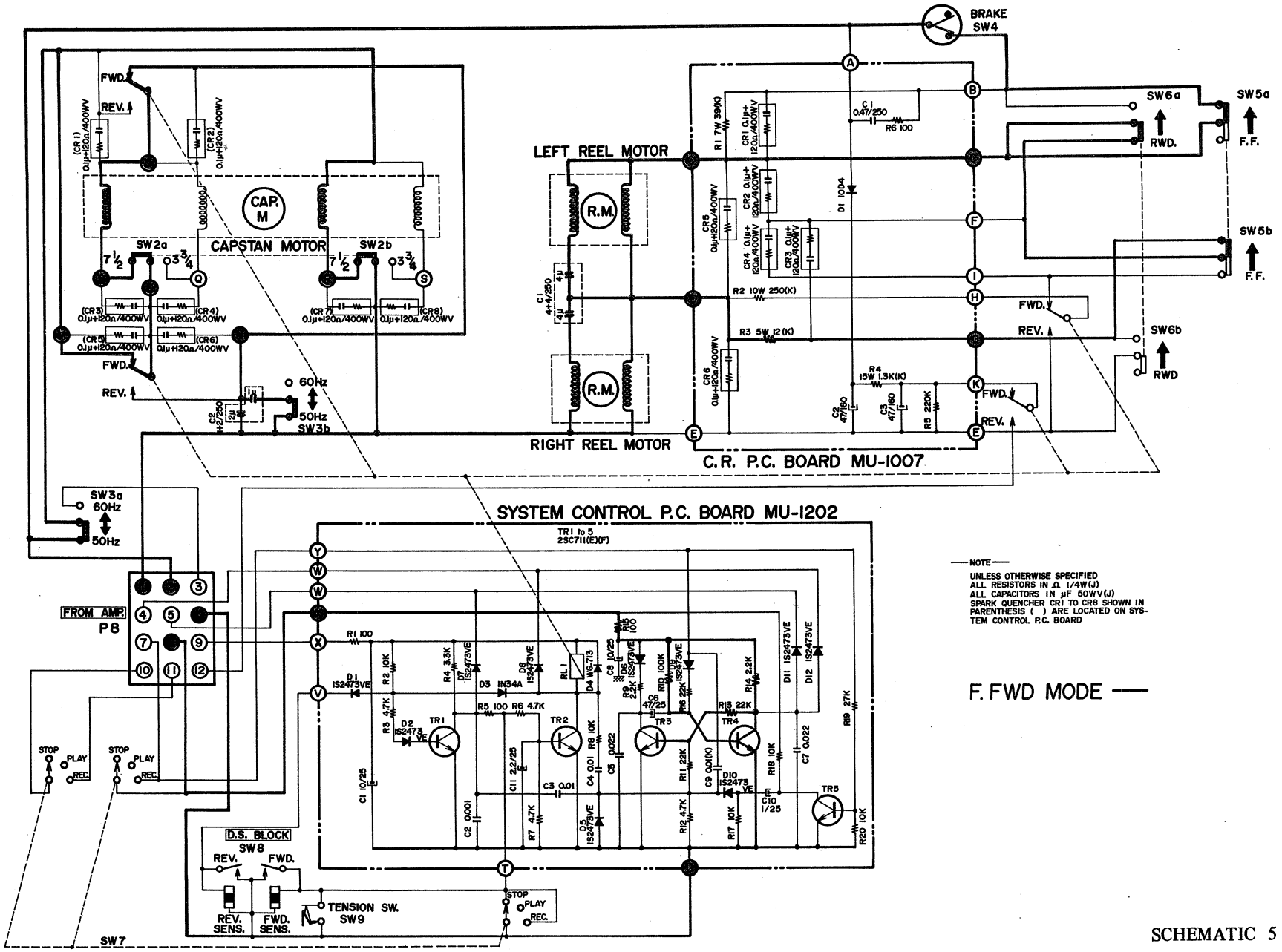
SCHEMATIC 3



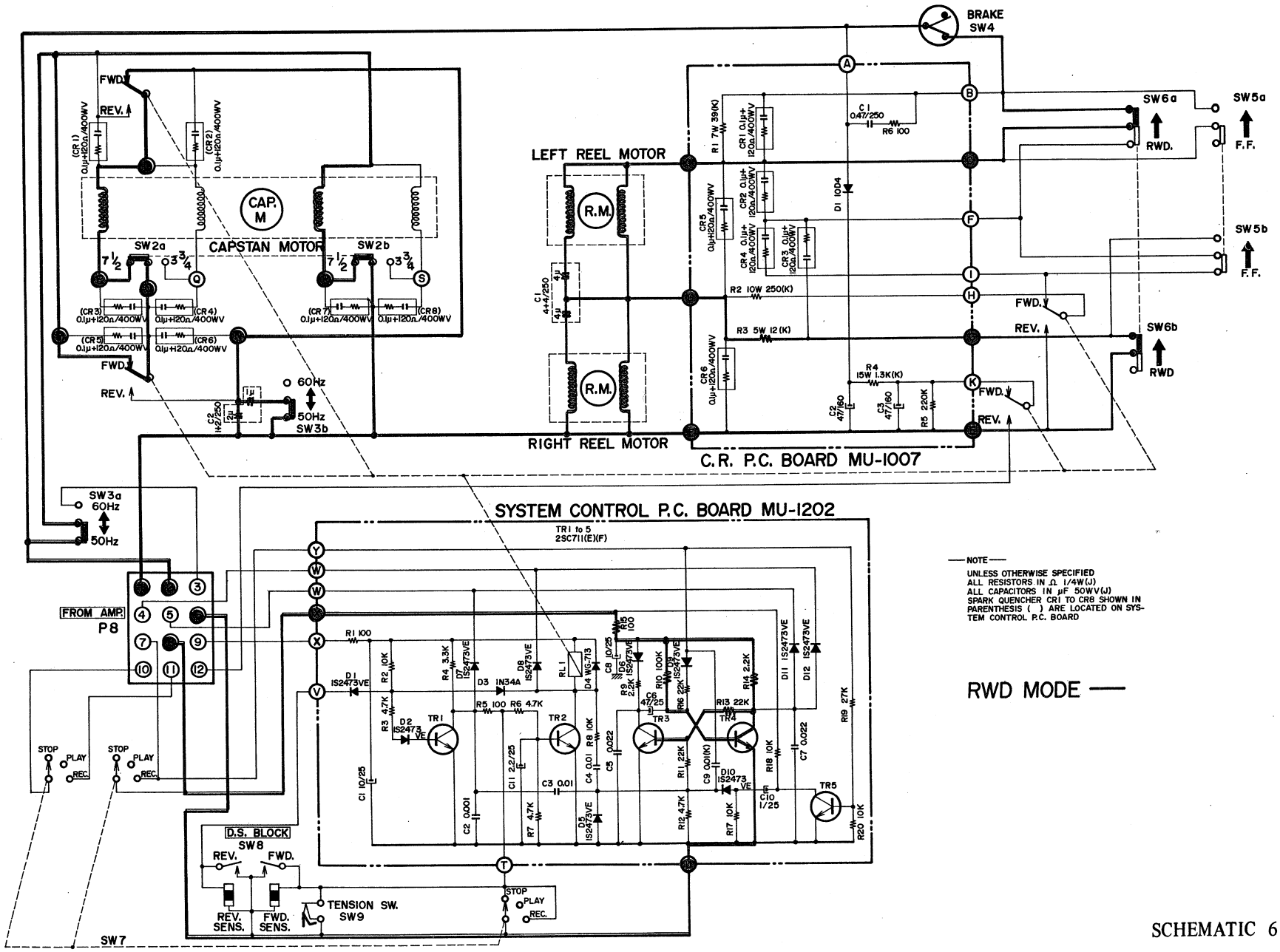

—NOTE—
UNLESS OTHERWISE SPECIFIED
ALL RESISTORS IN Ω 1/4W(J)
ALL CAPACITORS IN μF 50WV(J)
SPARK QUENCHER CR1 TO CR8 SHOWN IN PARENTHESIS ( ) ARE LOCATED ON SYSTEM CONTROL P.C. BOARD

REC. MODE —

SCHEMATIC 4


BRAKE SW4
LEFT REEL MOTOR
RIGHT REEL MOTOR
R.M.
CAP. M
CAPSTAN MOTOR
SW2a
SW2b
SW3a 60Hz 50Hz
SW3b 60Hz 50Hz
SW5a F.F.
SW5b F.F.
SW6a RWD.
SW6b RWD
FWD.
REV.
C.R. P.C. BOARD MU-1007
SYSTEM CONTROL P.C. BOARD MU-1202
TR1 to 5 2SC711(E)(F)
FROM AMP. P8
D.S. BLOCK SW8
TENSION SW. SW9
REV. SENS.
FWD. SENS.
SW7
STOP
PLAY
REC.
NOTE
UNLESS OTHERWISE SPECIFIED
ALL RESISTORS IN Ω 1/4W(J)
ALL CAPACITORS IN μF 50WV(J)
SPARK QUENCHER CR1 TO CR8 SHOWN IN PARENTHESIS ( ) ARE LOCATED ON SYSTEM CONTROL P.C. BOARD
F. FWD MODE

SCHEMATIC 5


BRAKE SW4
LEFT REEL MOTOR
RIGHT REEL MOTOR
CAP. M
CAPSTAN MOTOR
R.M.
SW2a
SW2b
SW3a
SW3b
60Hz
50Hz
FWD.
REV.
SW5a
SW5b
SW6a
SW6b
F.F.
RWD.
RWD
C.R. P.C. BOARD MU-1007
SYSTEM CONTROL P.C. BOARD MU-1202
TR1 to 5
2SC711(E)(F)
FROM AMP.
P8
D.S. BLOCK
SW8
REV. SENS.
FWD. SENS.
TENSION SW.
SW9
SW7
STOP
PLAY
REC.
TR1
TR2
TR3
TR4
TR5
D1 IS2473VE
D2 IS2473VE
D3 IN34A
D4 WG-713
D5 IS2473VE
D6 IS2473VE
D7 IS2473VE
D8 IS2473VE
D9 IS2473VE
D10 IS2473VE
D11 IS2473VE
D12 IS2473VE
R1 100
R2 10K
R3 4.7K
R4 3.3K
R5 100
R6 4.7K
R7 4.7K
R8 10K
R9 2.2K
R10 100K
R11 22K
R12 4.7K
R13 22K
R14 2.2K
R15 100
R16 22K
R17 10K
R18 10K
R19 27K
R20 10K
C1 10/25
C2 0.001
C3 0.01
C4 0.01
C5 0.022
C6 47/25
C7 0.022
C8 10/25
C9 0.01(K)
C10 1/25
C11 2.2/25
R1 7W 39K(K)
R2 10W 250(K)
R3 5W 12(K)
R4 15W 1.3K(K)
R5 220K
R6 100
C1 0.47/250
C2 47/160
C3 47/160
CR1 0.1μ+120Ω/400WV
CR2 0.1μ+120Ω/400WV
CR3 0.1μ+120Ω/400WV
CR4 0.1μ+120Ω/400WV
CR5 0.1μ+120Ω/400WV
CR6 0.1μ+120Ω/400WV
CR7 0.1μ+120Ω/400WV
CR8 0.1μ+120Ω/400WV
C1 4+4/250
C2 1+2/250
NOTE
UNLESS OTHERWISE SPECIFIED
ALL RESISTORS IN Ω 1/4W(J)
ALL CAPACITORS IN μF 50WV(J)
SPARK QUENCHER CR1 TO CR8 SHOWN IN PARENTHESIS ( ) ARE LOCATED ON SYSTEM CONTROL P.C. BOARD
RWD MODE

SCHEMATIC 6

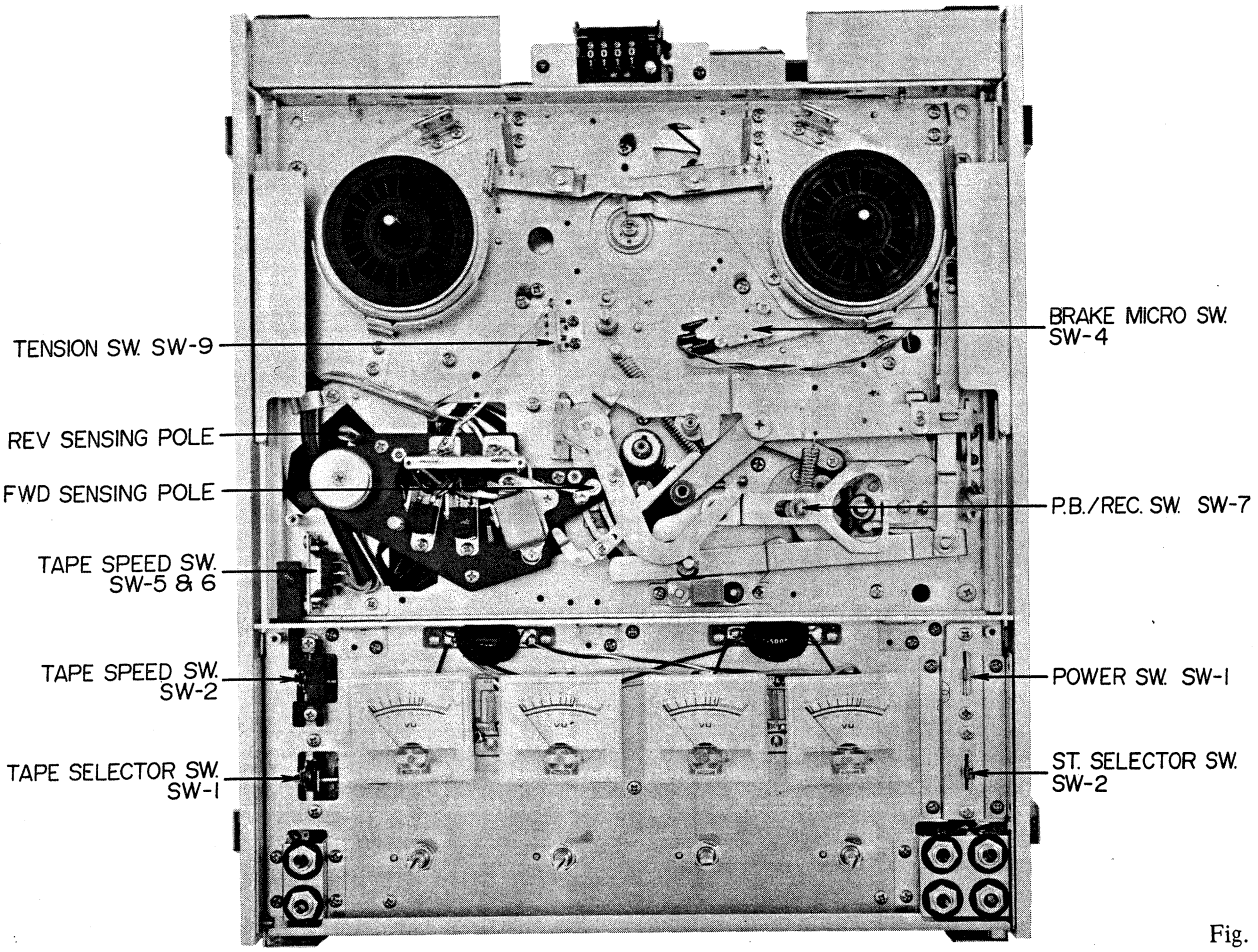



Fig. 7

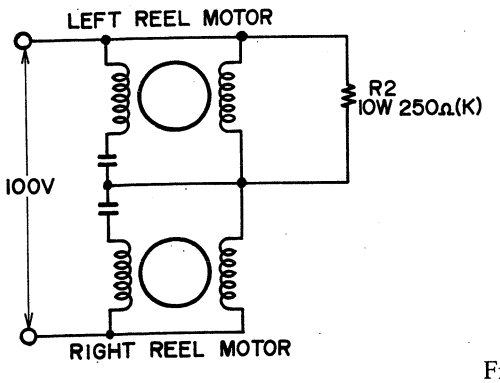



Fig. 8

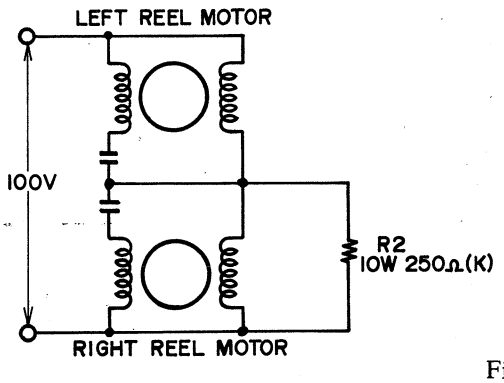



Fig. 9

## 1. STOP MODE (Refer to Schematic 1)

At stop mode, the various system control (hereinafter referred to as SYS.CON. transistors are maintained as follows: TR1(ON), TR2(OFF), TR3(OFF), and TR4(ON). Accordingly, the reverse relay connected to the collector of TR2 is OFF, and capstan motor revolutions are in forward direction. Also as TR4 is ON and TR4 collector voltage is roughly zero, and thus Diode D1 connected to the collector of TR4 (Playback Amp. P.C. Board) is turned OFF, the Playback Amp. Mute Circuit is also turned OFF. Both the supply and take-up reel motors are equipped with a Micro Switch SW4 which is activated to OFF and ON by the operation of the brake lever, and which at Stop Mode are turned OFF. Consequently, no voltage is supplied to either reel motor (both reel motors are connected in series).

When at stop mode, switching by means of P.B./REC Switch SW-7 does not take place because the base of SYS.CON.TR2 is grounded and maintained at OFF condition. That is to say, capstan motor revolutions will not reverse even when a REV Button is depressed. When the tension lever is raised, Tension Switch SW-9 is turned OFF. Thus, when no tape is loaded, this switch is ON. Also, because Tension Switch SW-9 is installed in parallel with P.B./REC Switch SW-7, when SW-7 is at stop mode, if a tape is loaded, but not threaded through the Tension Lever and playback is effected, reverse mode cannot be effected when a REV Button is depressed. And, of course, reverse mode will not be effected when the sensing foil passes the sensing poles.

## 2. FORWARD PLAYBACK MODE (Refer to Schematic 2)

When the P.B./REC Switch is at PLAY position, the various SYS.CON.transistors are maintained as follows: TR1(ON), TR2(OFF), TR3(OFF), and TR4(ON), i.e., functionally the same as at stop mode. The difference is that the base of TR2 which was grounded by P.B./REC Switch SW-7 is now open. That is to say, when TR1 is turned OFF and TR1 collector voltage increases, bias is supplied to TR2, and TR2 is turned ON.

Accordingly, while TR1 is (ON) and TR2 (OFF) (FWD Playback mode), capstan motor revolutions are in forward direction. Also Micro Switch SW-4 is ON, and voltage is supplied to both reel motors.

At FWD playback mode, an R2(10W, 250Ω) resistor is in parallel with left reel motor winding. That is to say, the left reel motor resistance differs from the right reel motor resistance due to the R2(10W, 250Ω) resistor which is parallel with the left reel motor as shown in Fig. 8. In short, the voltage supplied to the left reel motor is low and FWD playback mode is maintained.

## 3. FROM FWD TO REV PLAYBACK, AND REV PLAYBACK MODE (Refer to Schematic 2, 3)

When the sensing tape passes the reverse sensing poles or when the REV Button is depressed, the base of TR1 is biased at zero electrical potential and TR1 is instantly turned OFF, TR1 collector voltage increases and bias is applied to the base of TR2, TR2 is turned ON, and Reverse Relay RL1 is turned ON. In this TR1 and TR2 circuit, TR1 is maintained at OFF and TR2 at ON by means of Diode D3(IN34A). (Refer to Schematic Diagram-3)

By means of the reverse relay function, current flows from the reverse direction to the capstan motor sub coil, and reverse revolutions begin. Also, at FWD playback time, Resistor R2(10W, 250Ω) connected in parallel with the left reel motor becomes parallel with the right reel motor. (Refer to Fig. 9)

At this condition, reverse playback begins and is maintained, and the capstan motor revolutions begin reversing from forward direction. For normalized and stable revolutions, flywheel inertia at time of forward revolutions and flywheel mass when reverse revolutions begin is applied so that stabilized tape speed is not immediate, for this reason the signal output circuit must be muted until capstan motor speed is stabilized. (Refer to MUTING CIRCUIT OPERATION explanation)

Solenoid Plunger SL-1 also operates to switch Reverse Switch SW-1. In other words, the P.B. Amp. P.C. Board output is switched by means of Reverse Switch SW-1. (Refer to Fig. 10)

## 4. FROM REVERSE TO FORWARD PLAYBACK (Refer to Schematic 3)

When the sensing tape passes the FWD sensing pole or when the FWD Button is depressed and the base of TR2 becomes biased at zero electrical potential, TR2 is instantly turned OFF, and reverse relay RL-1 is also turned OFF.

Diode D3(1N34A) is also inverse biased, TR1 base current passes R2(10 kΩ), R3(4.7 kΩ), and D2 (1S2473VE) and is biased, and TR1 is turned ON and maintained. Consequently, reverse relay RL-1 returns to it's original condition (FWD P.B.) and FWD playback mode is effected. Refer to MUTING CIRCUIT OPERATION for mute function during change from REV to FWD playback.

## 5. RECORDING MODE (Refer to Schematic 4)

SYS.CON. operation at recording time is exactly the same as Stop mode.

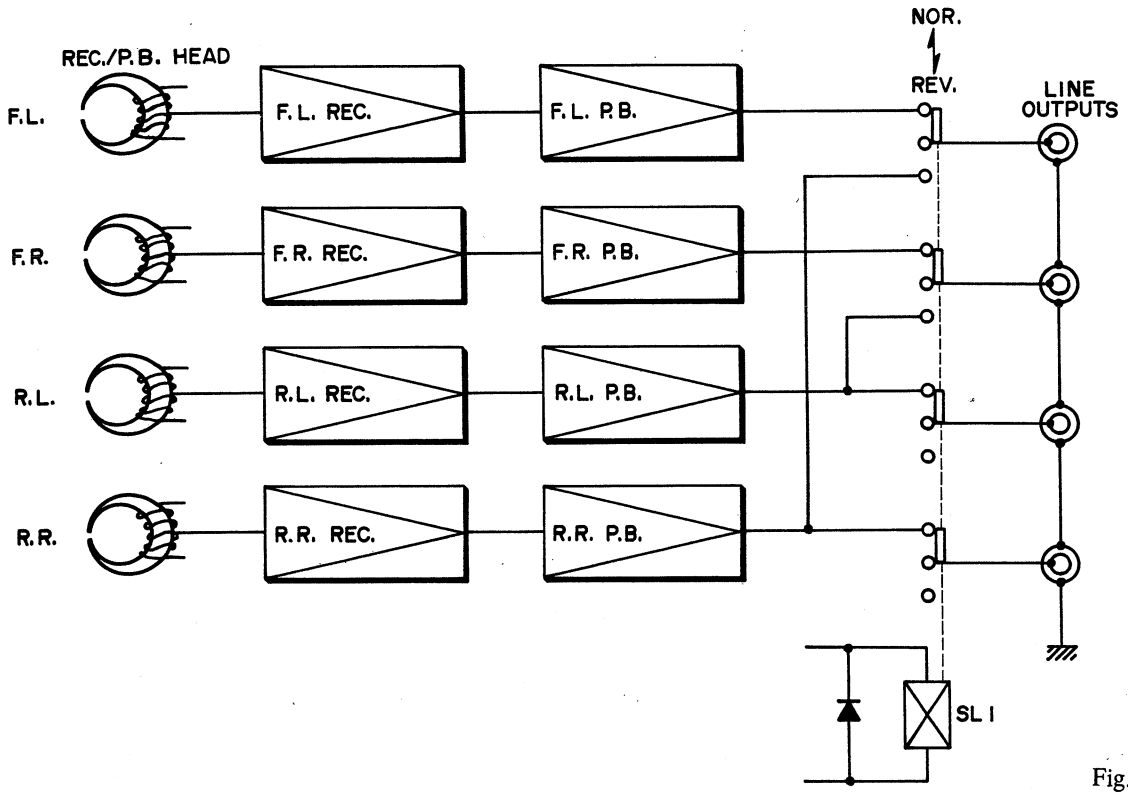
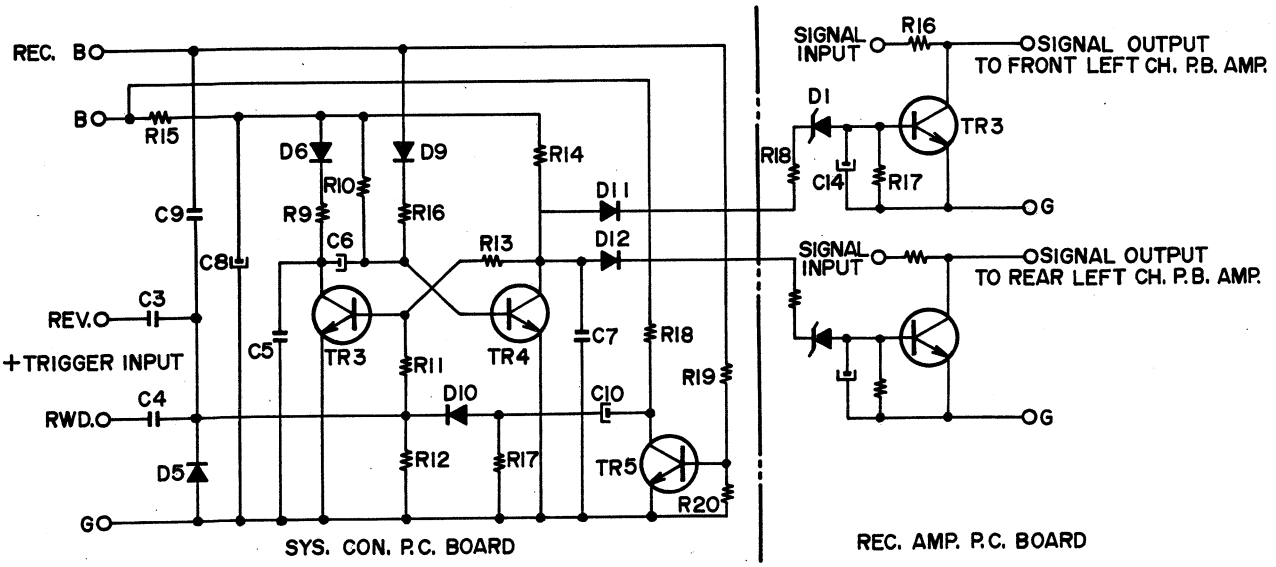



Fig. 10




SCHEMATIC 7

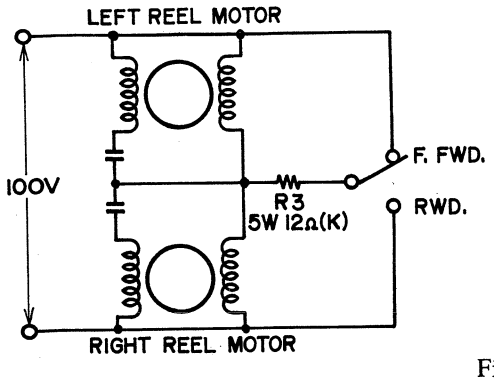



Fig. 11

## 6. FAST FORWARD AND REWIND MODE (Refer to Schematic 5, 6)

In this case, SYS.CON. operation is also exactly the same as Stop mode. However, the voltage supply to both reel motors are as shown in Fig. 11.

## 7. MUTING CIRCUIT OPERATION (Refer to Schematic 2, 3, and 7)

As shown in Schematic Diagram-7, the muting circuit consists of an electronic switch from Recording Amp. P.C. Board Transistor TR3 and a one-shot multi-vibrator comprised of SYS.CON. P.C. Board TR3 and TR4.

When stabilization is attained, TR3 of the one-shot multi-vibrator is turned OFF, and TR4 turned ON. Accordingly, the collector voltage of TR4 is lowered, Zener Diode D1 is biased in reverse direction, and TR3 of Recording Amp. P.C. Board is turned OFF.

If Button SW-8 is now depressed for FWD to REV Playback, or REV to FWD Playback, a charge current flows to condenser C3 or C4. That is to say, the positive direction trigger signal is introduced at the base of TR3 of SYS.CON. P.C. Board and therefore, the one-shot multi-vibrator which is comprized of TR3 and TR4 is inverted and, after a certain period of time (2 to 3 seconds), again returns to it's stabilized condition. While this one-shot multi-vibrator is inverted (while TR4 is OFF), because TR4 collector voltage is high, the voltage exceeding the Zener Point of Zener Diode D1 is applied to the cathode of D1 and D1 assumes a lead-through condition. Thus, electronic switch Transistor TR3 is turned ON, and the signal is muted. (The internal resistance of electronic switch TR3 at lead-through time is extremely low.)

At recording time, a charge current flows to condenser C9 in the same way as described above. That is to say, the one-shot multi-vibrator is inverted and the mute circuit functions. Also when stop is effected from recording mode, TR5 is turned OFF, and because a charge current flows to C10 through R18, the mute circuit functions. Thus, at recording time or when returned to stop mode, these functions prevent a click noise from being recorded on the tape.

# V. MECHANISM ADJUSTMENTS

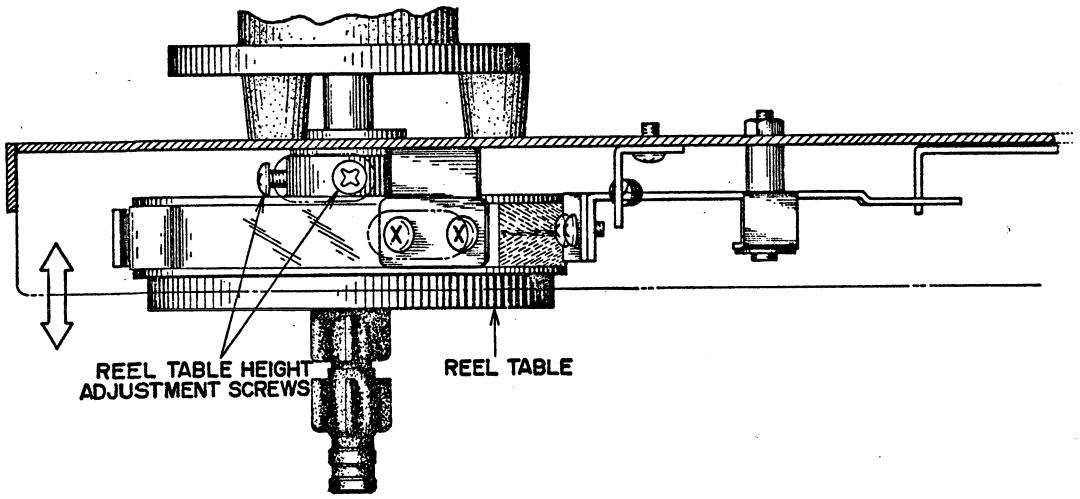



Fig. 12

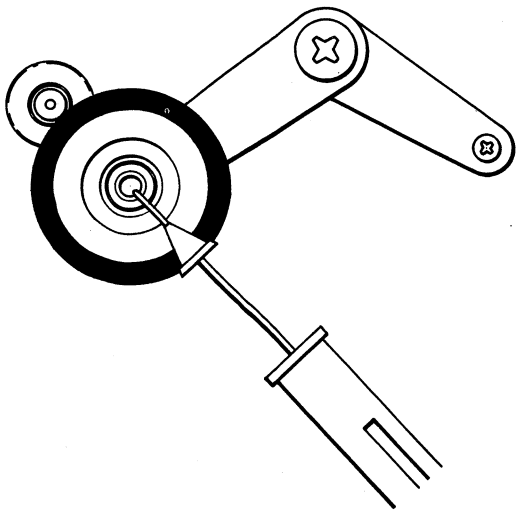


Fig. 13

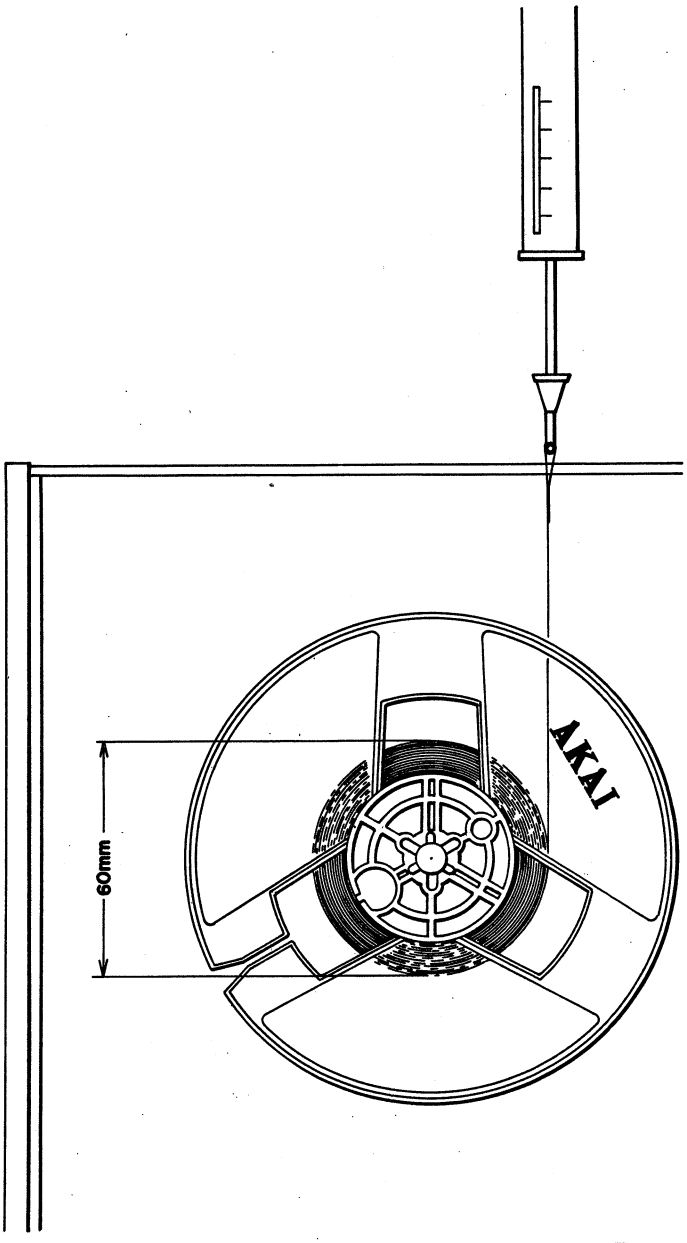



Fig. 14

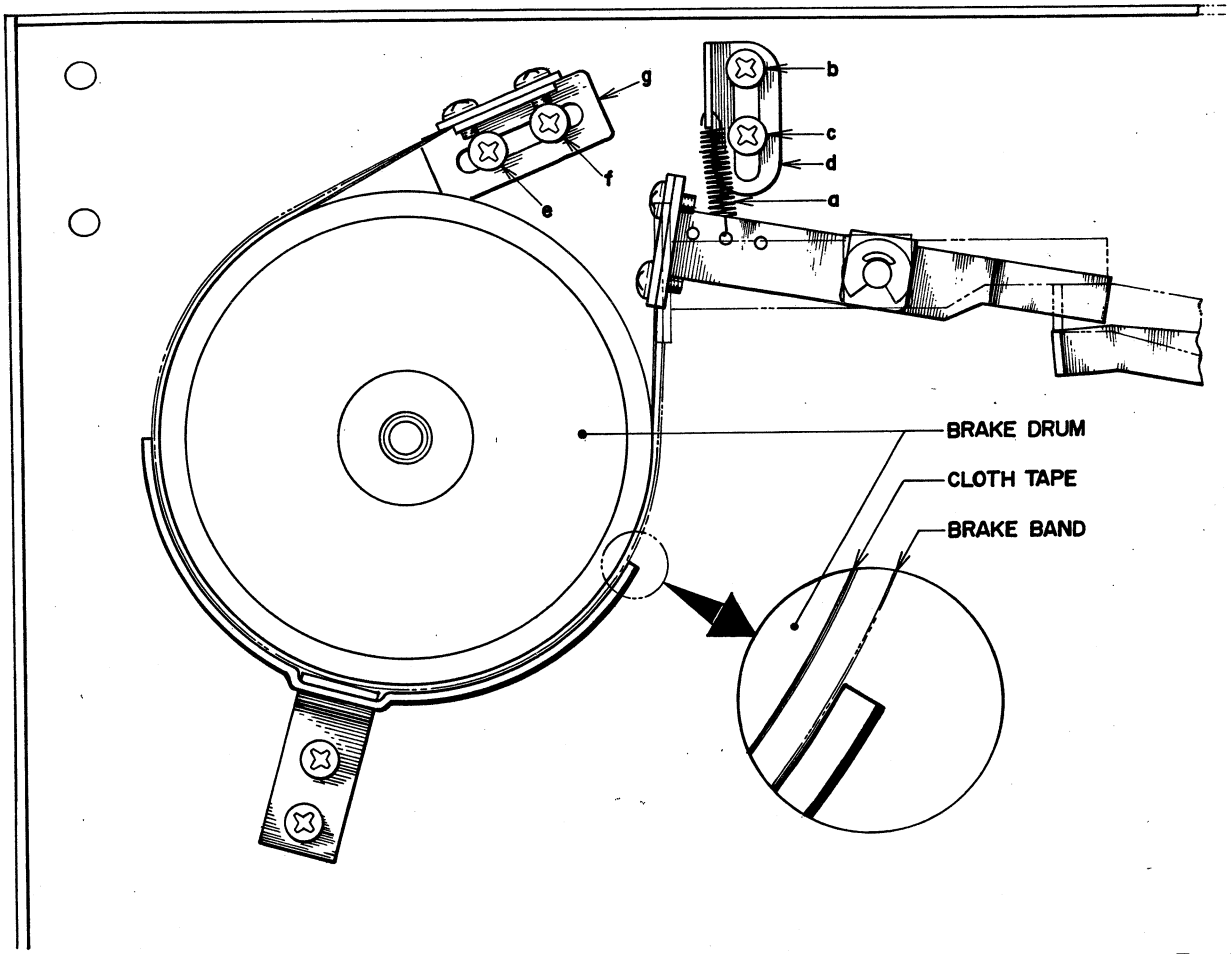



Fig. 15

## 1. REEL TABLE HEIGHT ADJUSTMENT

As shown in Fig. 12, loosen reel table height adjustment screws, and adjust reel table height by moving table in direction of arrow and positioning so that the tape winds in the center of the reel.

## 2. PINCH WHEEL PRESSURE MEASURING METHOD

Measure pinch wheel pressure with a tension gauge as shown in Fig. 13. Read the value on the tension gauge as soon as the pinch wheel separates from the tape and tape travel stops. Ideal pinch wheel pressure is 1.8 kg.

## 3. BRAKE TENSION ADJUSTMENT

1) As shown in Fig. 14, use a 60 mm diameter tape wound on a 5" reel and measure the brake tension with a tension gauge. Ideal brake tension is from 300 to 370 grams.
2) Brake tension adjustment can be made as follows: (Refer to Fig. 15)
   a) Change position of suspended spring (a).
   b) Loosen screws (b) and (c) and adjust the vertical position of spring suspension metal (d).
   c) Loosen screws (e) and (f) and adjust the horizontal position of brake band suspension metal (g).
   d) Only the left side is shown in Fig. 15, but the right side must be adjusted in the same way.

NOTE: In making brake tension adjustment, at all modes except stop mode, confirm that the brake band completely separates from the cloth tape on the brake drum. (Refer to Fig. 15)

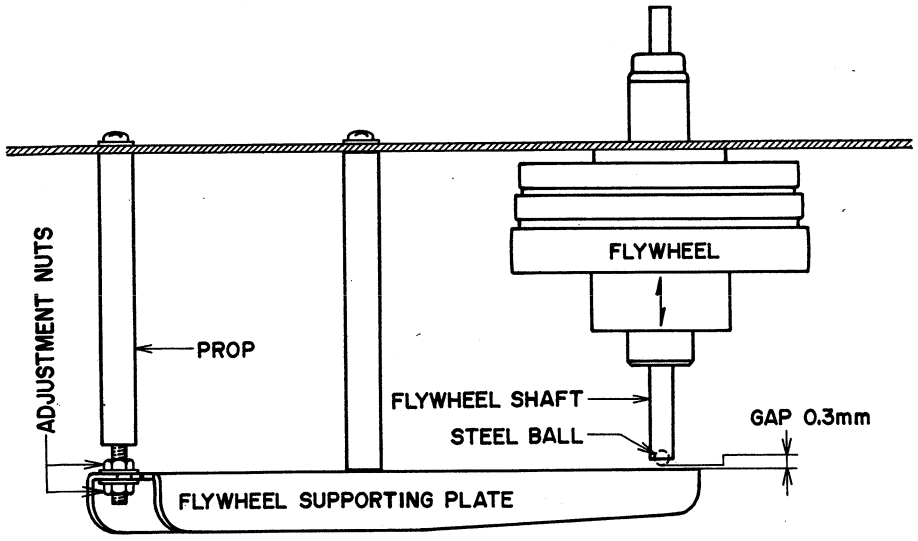



Fig. 16

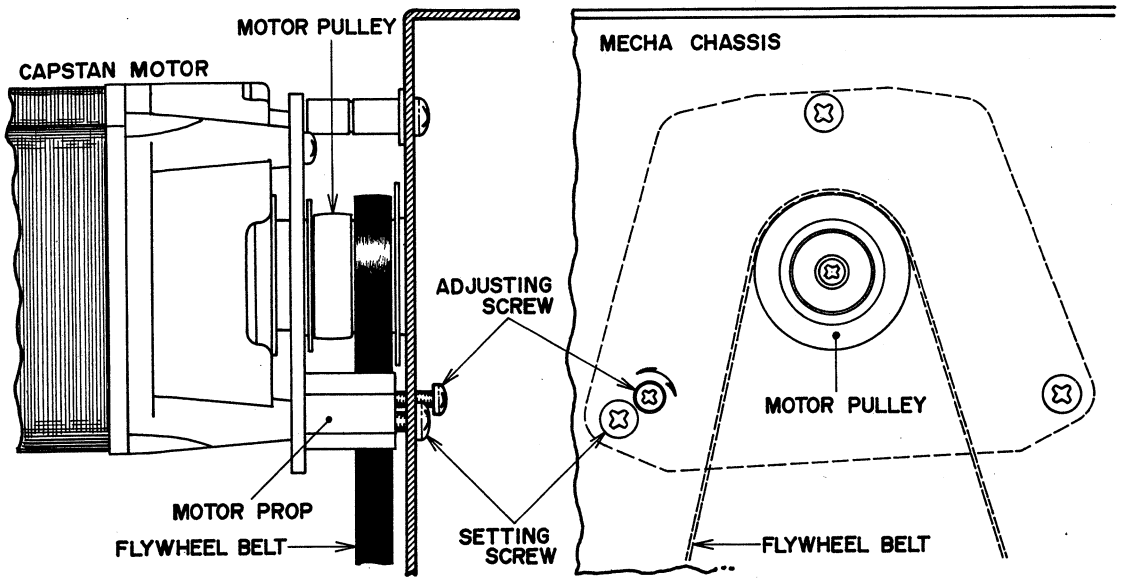



Fig. 17

## 4. LEFT AND RIGHT REEL MOTOR TENSION AT VARIOUS OPERATING MODES

| Mode \ Reel Motor | Left Reel Motor | Right Reel Motor |
|---|---|---|
| FWD P.B. | 60g | 180g |
| REV P.B. | 180g | 60g |
| F.FWD | 10g | 450g |
| RWD | 450g | 10g |

Chart 1

## 5. FLYWHEEL LOOSE PLAY ADJUSTMENT

Turn the adjustment nuts to obtain a 0.3 mm gap between the steel ball and flywheel supporting plate when the flywheel is moved in the direction of the arrow as shown in Fig. 16.

## 6. FLYWHEEL BELT POSITION ADJUSTMENT

1) With capstan motor revolutions operating at Rev. mode, loosen setting screw and turn flywheel belt position adjustment screw until the flywheel belt comes to the center of the motor pulley. (Refer to Fig. 17)
2) Tighten setting screw to maintain center positioning of flywheel belt at Rev. mode.
3) Confirm that the flywheel belt runs on the center of the motor pulley at Fwd. mode also.

# VI. HEAD ADJUSTMENTS

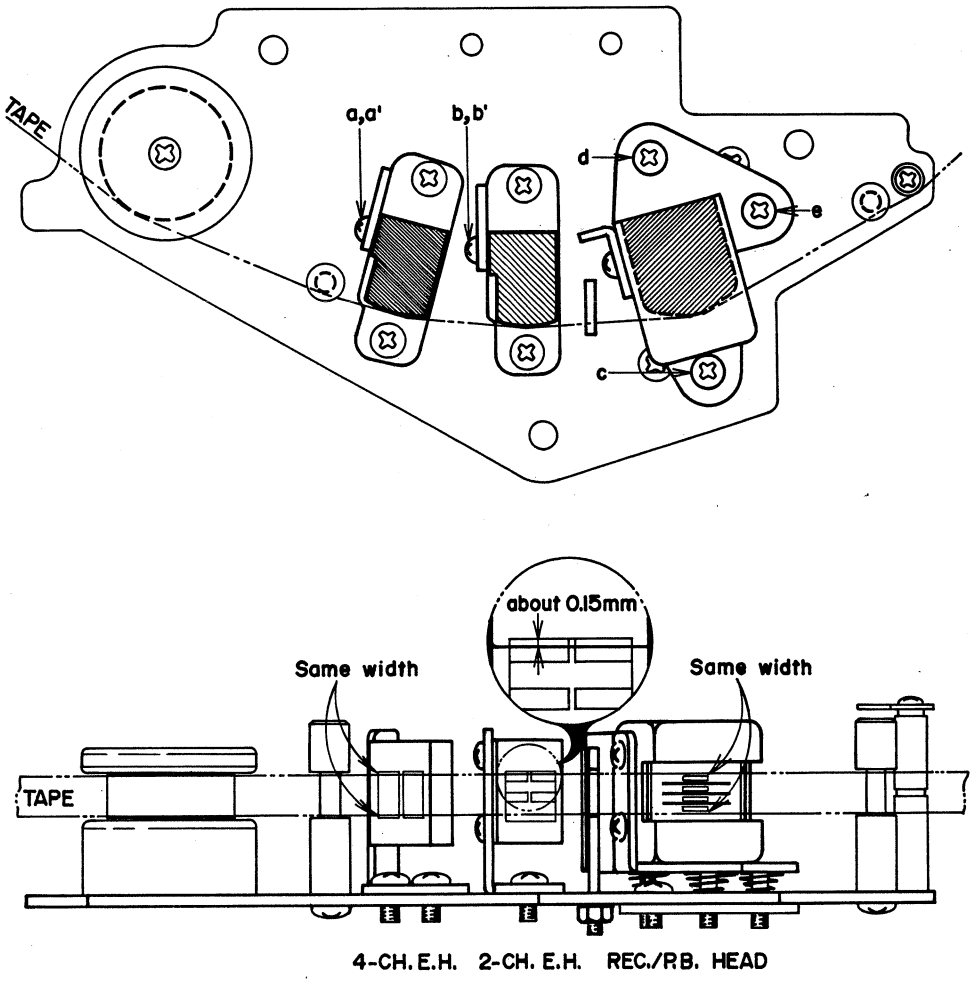



Fig. 18

## 1. HEAD HEIGHT ADJUSTMENT (See Fig. 18)

**1) Erase Head (2-CH)**
Loosen Erase Head Screws (b) (b') and adjust Erase Head height so that the upper edge of the tape is about 0.15 mm lower than the upper Erase Head core.

**2) Erase Head (4-CH)**
Loosen Erase Head Screw (a) (a') and adjust Erase Head height so that the tape is equidistant in relation to the top and bottom edges of the Erase Head core (width between top edge of tape and top edge of head core is the same as the distance between the bottom edge of the tape and the bottom edge of the head core).

**3) Recording/Playback Head**
Adjust Recording/Playback Head Height by turning Recording/Playback Head Height Adjustment Screws (c) (d), to left and right until the width between the upper edge of Channel 1 Head Core and the upper edge of the tape is equal to the width between the lower edge of Channel 4 Head Core and the lower edge of the tape.

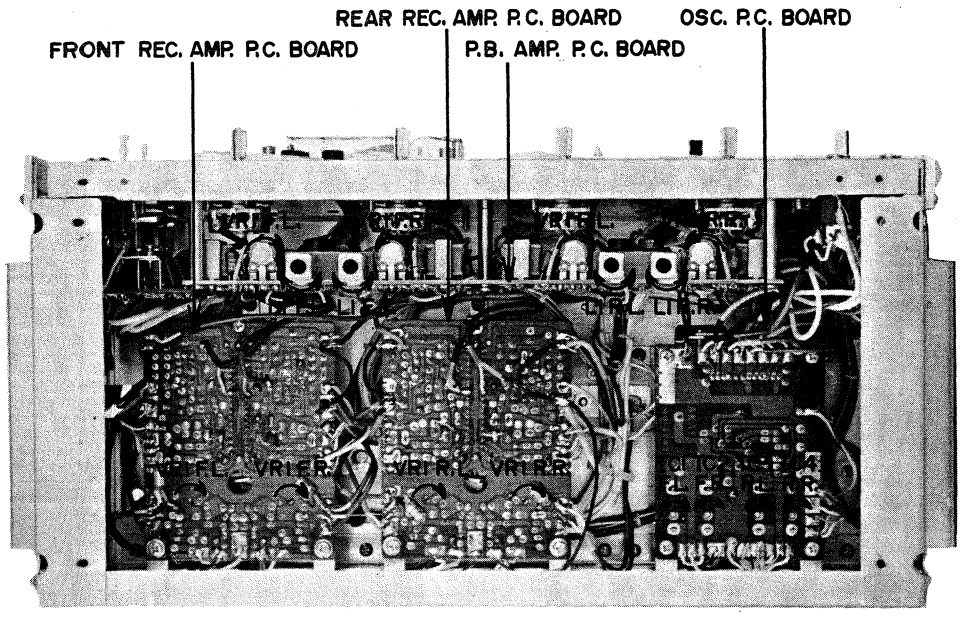
## 2. RECORDING/PLAYBACK HEAD SLANT ADJUSTMENT (See Fig. 18)

By turning Head Height Adjustment Screws (c) (d) to left and right, adjust so that the Recording/Playback Head contacts the tape surface at a right angle (head is at right angle in relation to tape surface).

## 3. RECORDING/PLAYBACK HEAD AZIMUTH ALIGNMENT ADJUSTMENT (See Fig. 18)

Connect a High Sensitivity V.T.V.M. to the Line Output and playback a Head Alignment Test Tape (8,000 Hz, 3-3/4 ips.). Adjust by turning Head Alignment Adjustment Screw (e) to left and right until the various line outputs reach maximum.

**4. Repeat adjustments outlined in 1-3) as well as 2. and 3. above two or three times to obtain optimum adjusted condition.**




REF : ARROW INDICATES MAX

F.L. FRONT LEFT CHANNEL
F.R. FRONT RIGHT CHANNEL
R.L. REAR LEFT CHANNEL
R.R. REAR RIGHT CHANNEL

Fig. 19

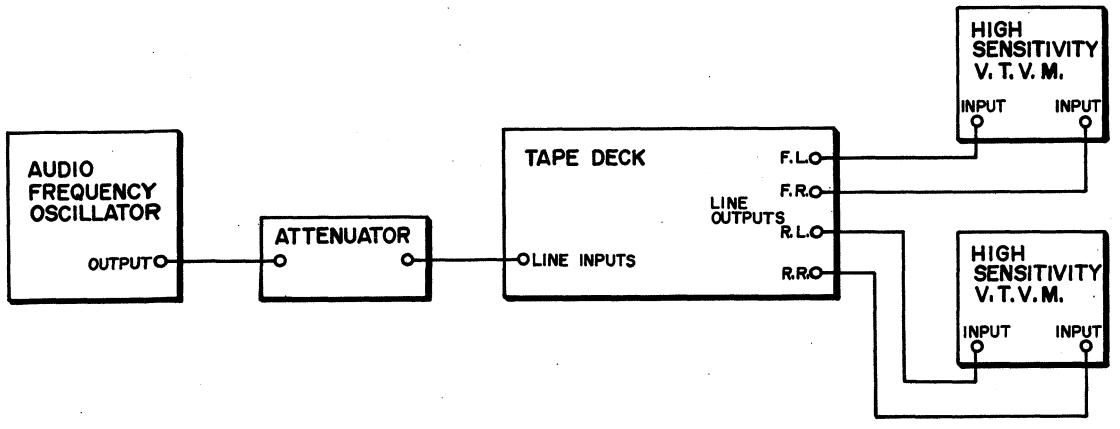



Fig. 20

# VII. AMPLIFIER ADJUSTMENTS

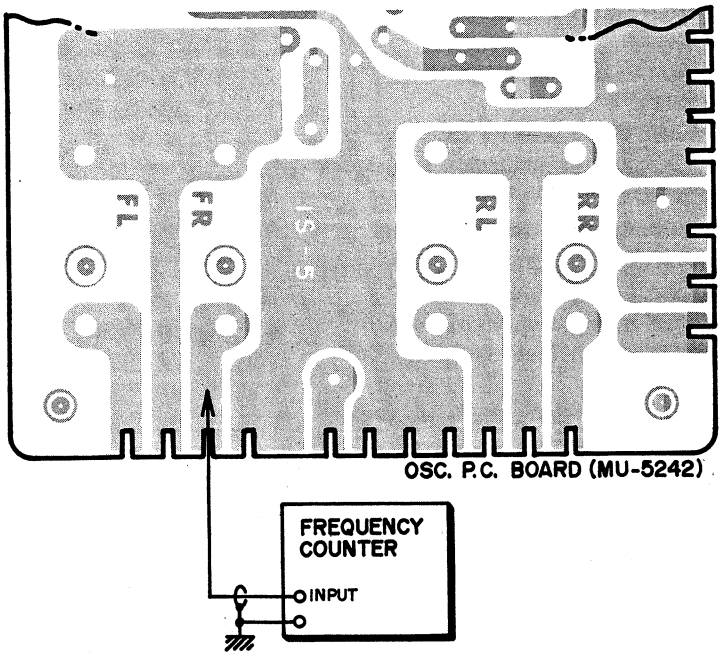



Fig. 21

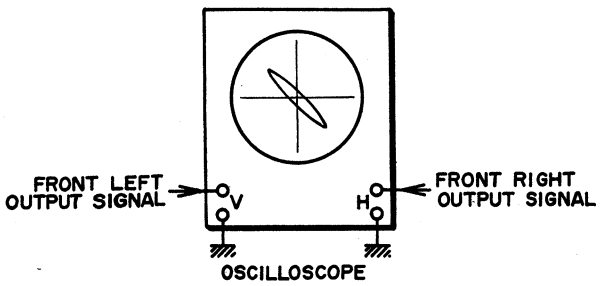



Fig. 22

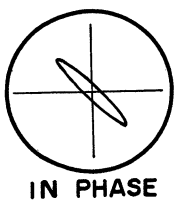



Fig. 23

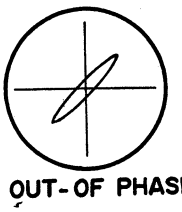



Fig. 24

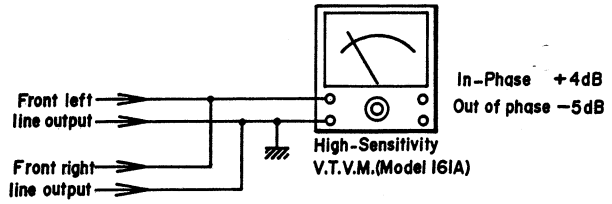



Fig. 25

Connect the various measuring instruments as shown in Fig. 20.

## 1. PLAYBACK LEVEL ADJUSTMENT

1) Set Tape Speed Selector to 7-1/2 ips.
2) Set Stereo Selector to 4-CH.
3) Playback a 250 Hz 7-1/2 ips. recorded test tape.
4) Adjust Playback Amp. P.C. Board semi-fixed resistor VR1 50 kB shown in Fig. 19 to obtain a 4 dB(1.228V) high sensitivity V.T.V.M. output level indication on each channel.

| | |
|---|---|
| VR1 F.L.: | FRONT LEFT CHANNEL |
| VR1 F.R.: | FRONT RIGHT CHANNEL |
| VR1 R.L.: | REAR LEFT CHANNEL |
| VR1 R.R.: | REAR RIGHT CHANNEL |

## 2. RECORDING LEVEL ADJUSTMENT

1) Set Tape Speed Selector to 7-1/2 ips.
2) Set Stereo Selector to 4-CH.
3) Set all 4 Recording Level Controls VR1 through VR4 50 kA (F.L., F.R., R.L., and R.R.) to maximum (fully clockwise) and load a blank tape.
4) Set tape deck to recording mode and supply a 1,000 Hz sine wave signal to the line input from the audio frequency oscillator.
5) Adjust the attenuator to obtain a 4 dB(1.228V) high sensitivity V.T.V.M. output level indication on all 4 channels.
6) Under the condition described above, record a 1,000 Hz 4 dB signal for a few seconds on the blank tape, and playback this recording.
7) Adjust Recording Amp. P.C. Board semi-fixed resistor VR1 5 kB shown in Fig. 19 so that at playback time, the high sensitivity V.T.V.M. line output level indication is 4 dB(1.228V) on each channel.

| | |
|---|---|
| VR1 F.L.: | FRONT LEFT CHANNEL |
| VR1 F.R.: | FRONT RIGHT CHANNEL |
| VR1 R.L.: | REAR LEFT CHANNEL |
| VR1 R.R.: | REAR RIGHT CHANNEL |

## 3. BIAS LEAK ADJUSTMENT

1) Following recording level adjustment, remove the line input and set tape deck to recording mode.
2) Switch the high sensitivity V.T.V.M. range to -30 dB range.
3) Adjust the core of Playback Amp. P.C. Board Coil L1 22 mH to obtain minimum high sensitivity V.T.V.M. indication on each channel.
4) Bias leak must be less than -26 dB at 4-CH, and less than -16 dB at 2-CH.

## 4. FREQUENCY RESPONSE ADJUSTMENT

1) Set Tape Speed Selector to 7-1/2 ips.
2) Set Stereo Selector to 4-CH.
3) Set Tape Selector to NORMAL.
4) Turn all Recording Level Controls (VR1 through VR4, 50 kA) to maximum (fully clockwise) and load a blank tape.
5) Set tape deck to recording mode and supply a 1,000 Hz sine wave to the line input from Audio Frequency Oscillator and adjust the attenuator to obtain a -16 dB(120 mV) high sensitivity V.T.V.M. line output level indication on all 4 channels.
6) Switch the oscillation frequency of the Audio Frequency Oscillator from the condition described in Items 4-5) above to 10,000 Hz.
7) Adjust OSC. P.C. Board Trimmer Condensers TC1 through TC4 shown in Fig. 19 to obtain the same V.T.V.M. level indication on all channels at both the 1,000 Hz and 10,000 Hz frequencies.

| | |
|---|---|
| TC1: | FRONT LEFT CHANNEL |
| TC2: | FRONT RIGHT CHANNEL |
| TC3: | REAR LEFT CHANNEL |
| TC4: | REAR RIGHT CHANNEL |

## 5. RECORDING BIAS FREQUENCY MEASURING METHOD

As shown in Fig. 21, connect a Frequency Counter to the output side of the trimmer condenser. Set tape deck to recording mode and take a frequency counter reading. Specified recording bias frequency is 82±5 kHz.

## 6. 4-CHANNEL PHASE CHECK

### CHECK A

1) Connect front left signal and front right signal line outputs to the vertical and horizontal input of an Oscilloscope. (See Fig. 22)
2) Playback a 250 Hz 7-1/2 ips. pre-recorded test tape.
3) If front left signal and front right signal is in phase, the waveform on oscilloscope screen will appear as shown in Fig. 23.
4) If front left signal and front right signal is out of phase (180° phase inverted), the waveform on oscilloscope screen will appear as shown in Fig. 24.
5) Make the same phase check on front left/rear left and rear left/rear right signals.
6) In case out of phase signals exist, head connection is reversed or playback head adjustment is necessary.

### CHECK B

1) Playback a 250 Hz 7-1/2 ips. pre-recorded test tape.
2) Connect front left signal and front right signal line outputs in parallel and connect to the inputs of a high sensitivity V.T.V.M. (See fig. 25)
3) If front left signal and front right signal is in phase, the high sensitivity V.T.V.M. indication will be about 4 dB.
4) If front left signal and front right signal is out of phase (180° phase inverted), the high sensitivity V.T.V.M. indication will be about -5 dB.
5) Make the same phase check on front left/rear left and rear left/rear right signals.

# VIII. D. C. RESISTANCE OF VARIOUS COILS

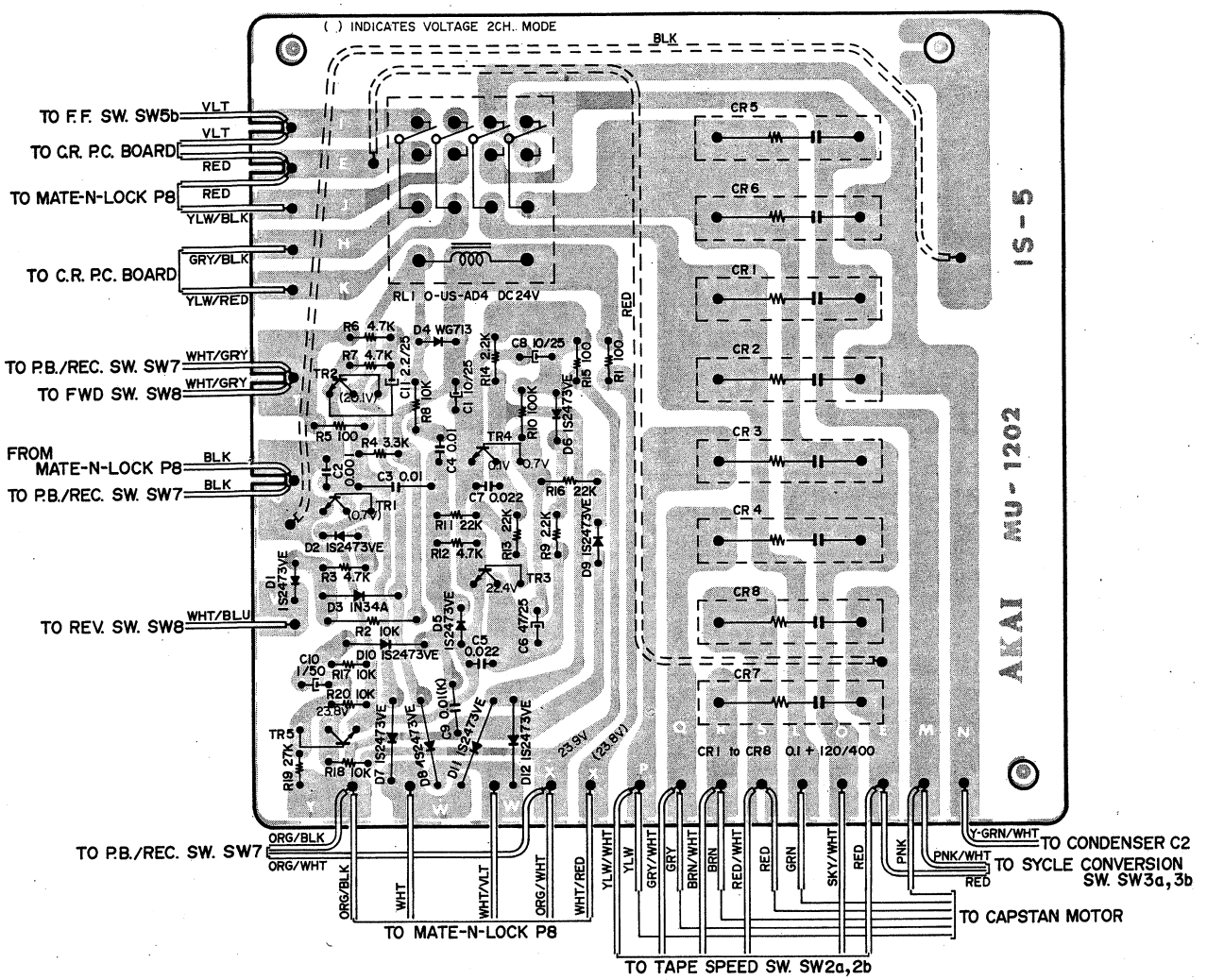
D.C. Resistance shown in chart are average values.

| Parts | Designation | D.C. Resistance |
|---|---|---|
| CAPSTAN MOTOR | HM-12-16MC | Between PNK-RED 130Ω<br>Between PNK-BRN 180Ω<br>Between GRN-GRY 360Ω<br>Between GRN-YLW 370Ω |
| REEL MOTOR | 24XO-MR | Between RED-BLU 74Ω<br>Between GRN-YLW 166Ω |
| REVERSE SOLENOID | 0730 THTI3 | 290Ω |
| REVERSE RELAY | MY4-O-US-AD4 DC24V | 650Ω |
| HEADPHONE OUTPUT TRANSFORMER | N19-5921S | Primary 230Ω<br>Secondary 0.9Ω |
| OSCILLATOR COIL | OT-204 | Between 1-3 0.3Ω<br>Between 4-6 0.7Ω<br>Between 7-9 8.2Ω |
| FULL TRACK ERASE HEAD | EF-210 | 2.8Ω |
| 4 TRACK ERASE HEAD | E4-260 | 1.6Ω |
| 4 TRACK RECORDING/PLAYBACK HEAD | P4-50 | 160Ω |

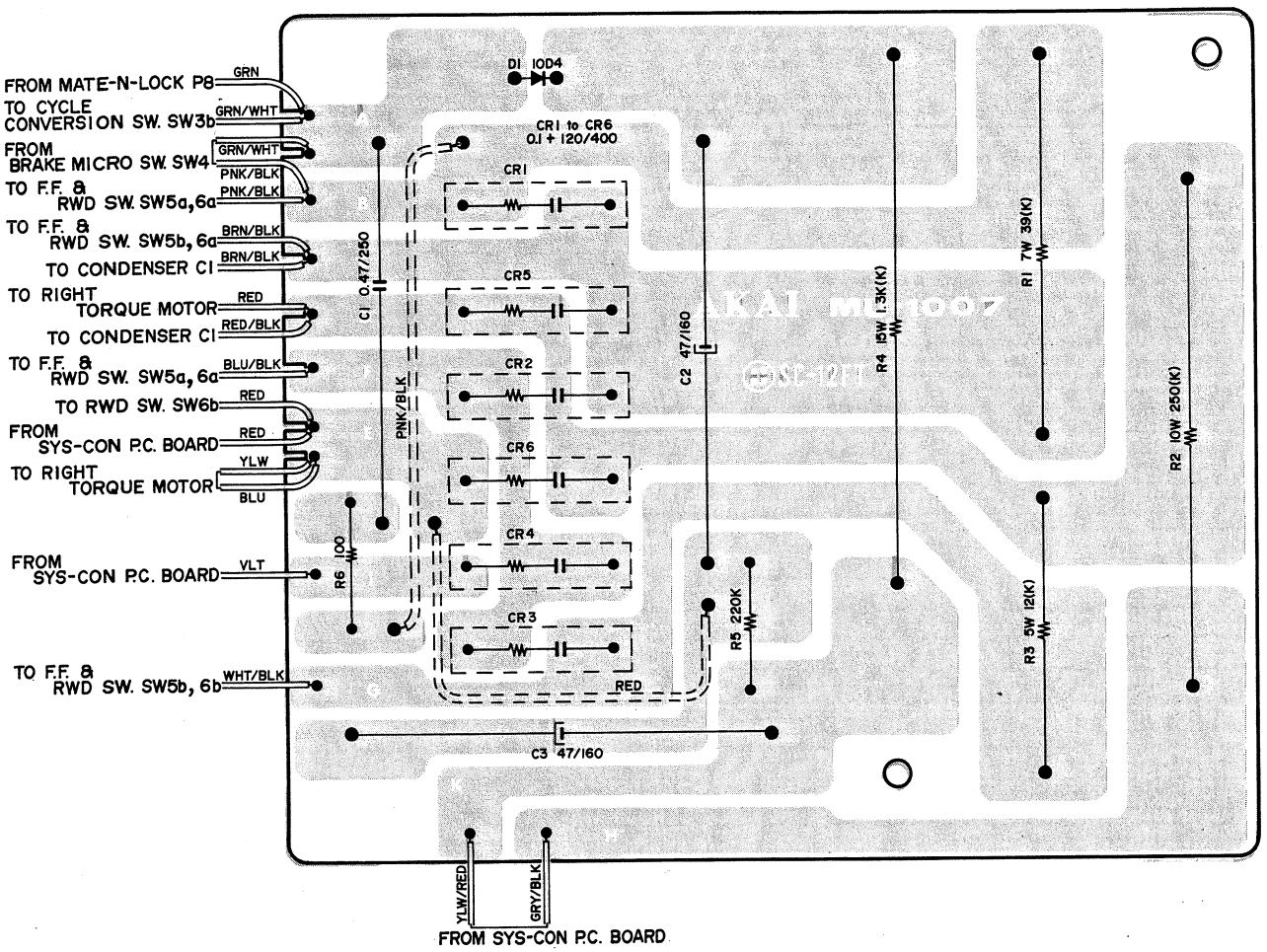
Chart 2

# IX. COMPOSITE VIEWS OF COMPONENTS

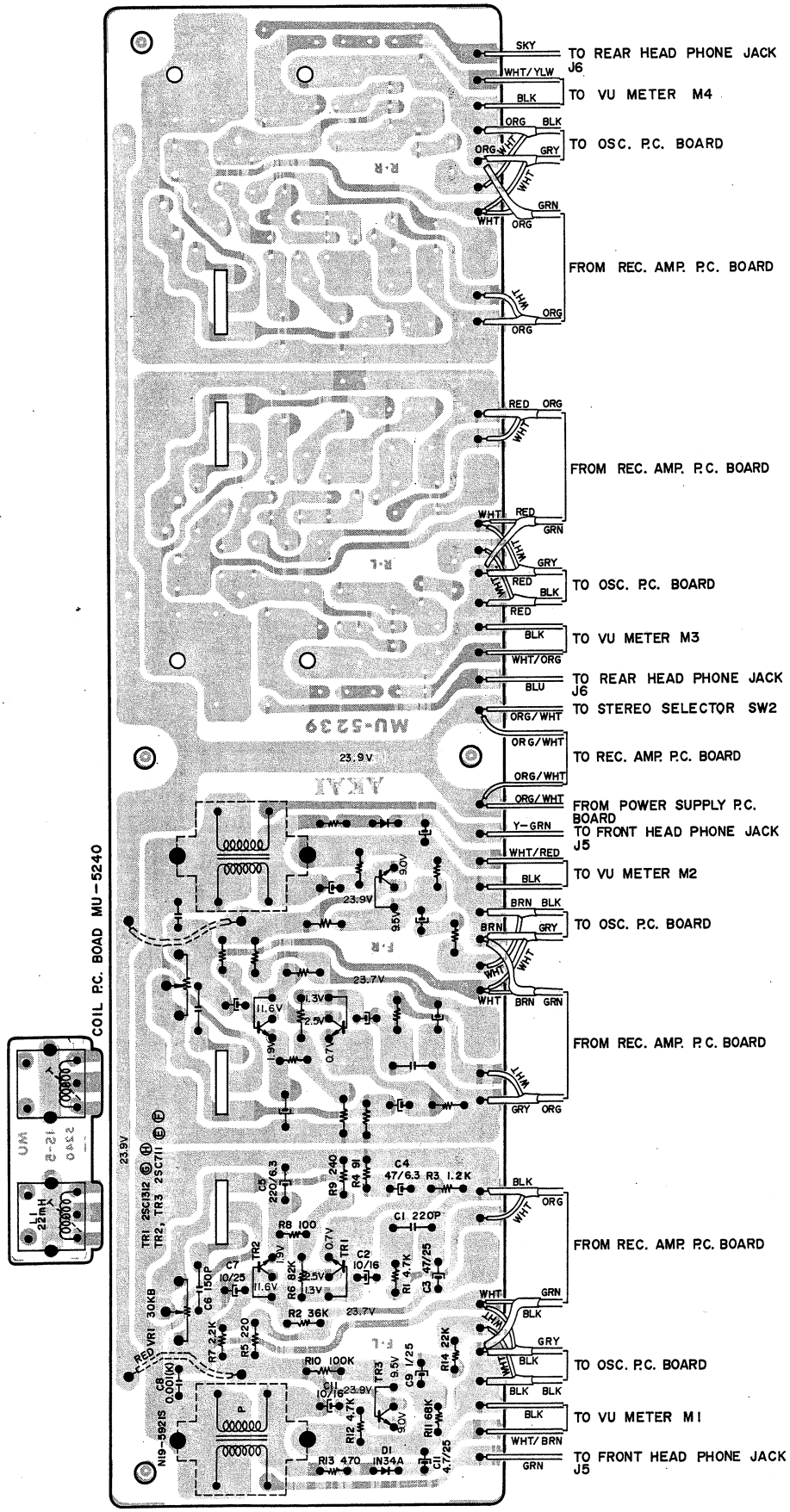
## 1. SYSTEM CONTROL P.C. BOARD MU-1202



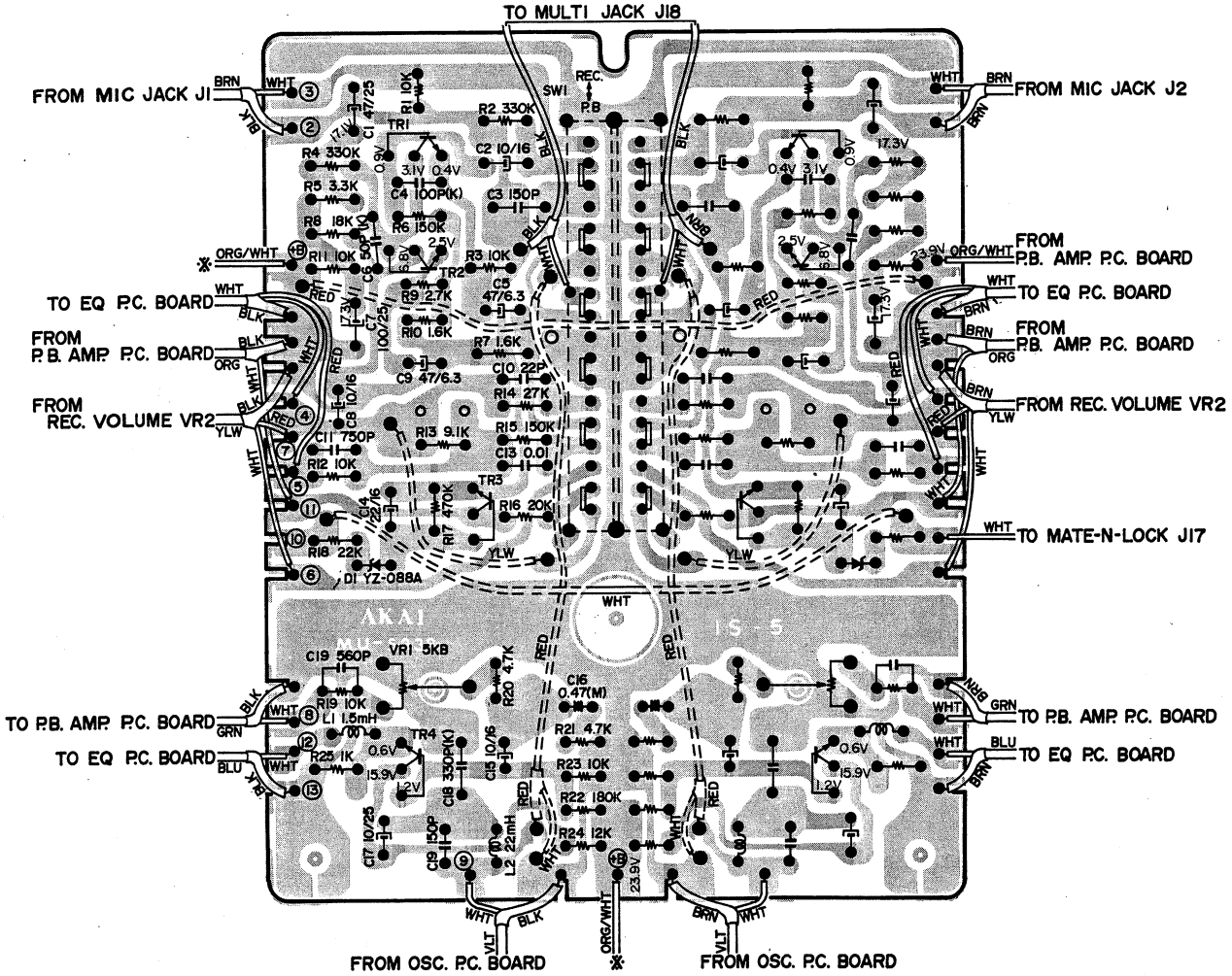
## 2. CR P.C. BOARD MU-1007



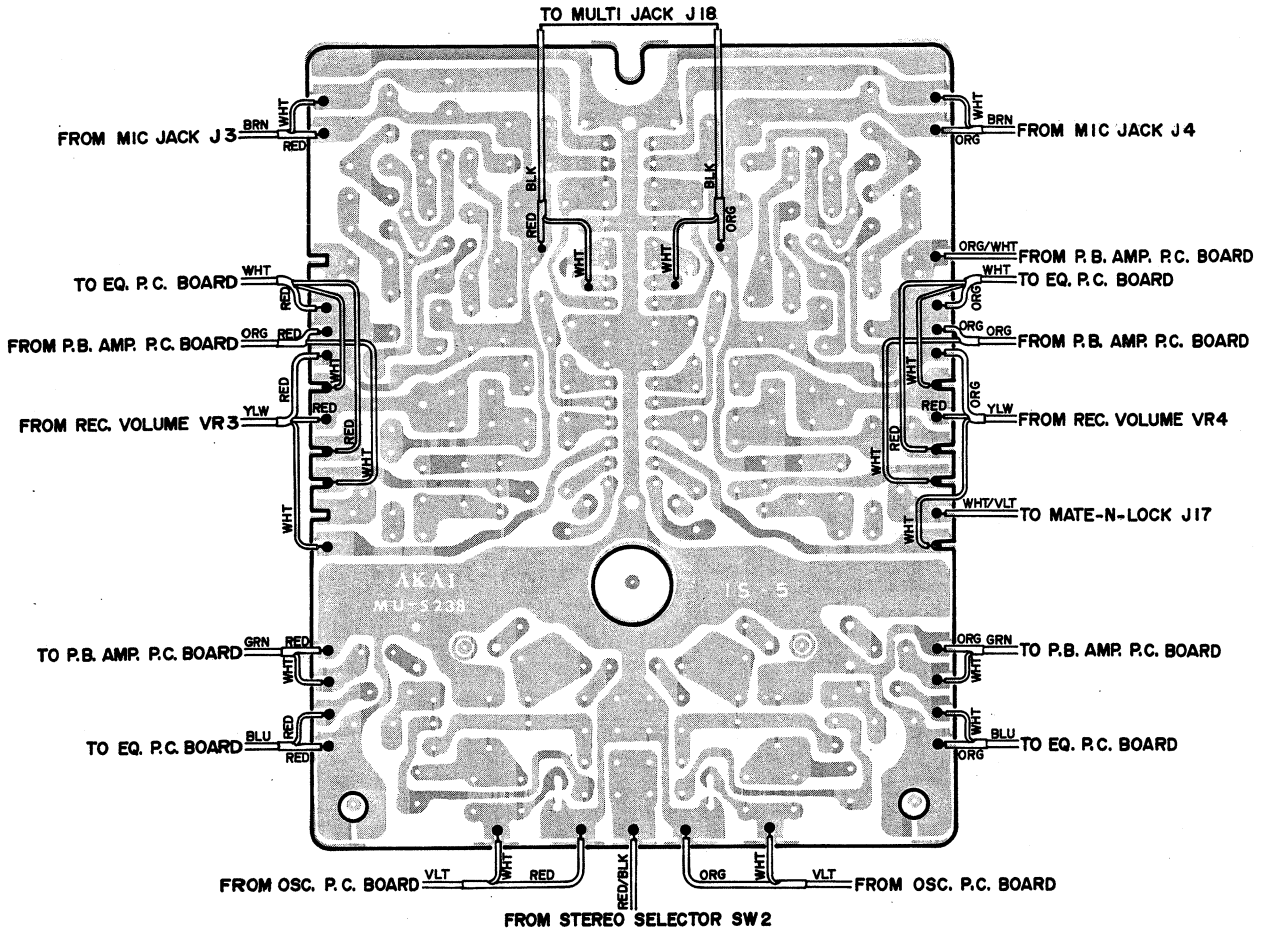
## 3. PB. AMP. P.C. BOARD MU-5239



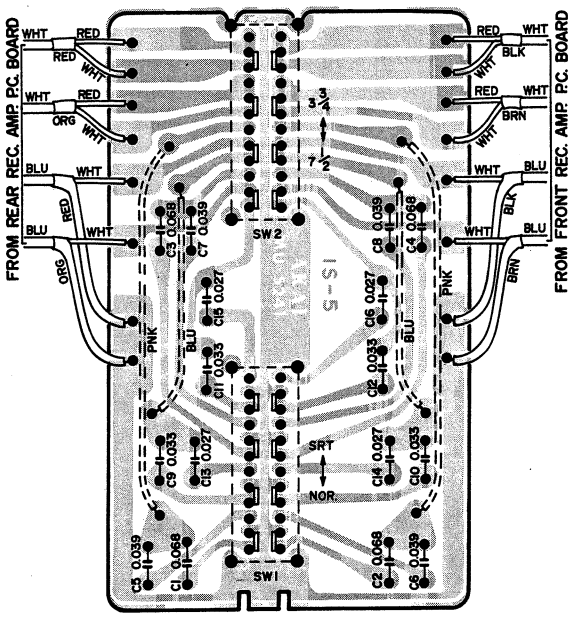
## 4. REC. AMP. P.C. BOARD MU-5238 (FRONT)



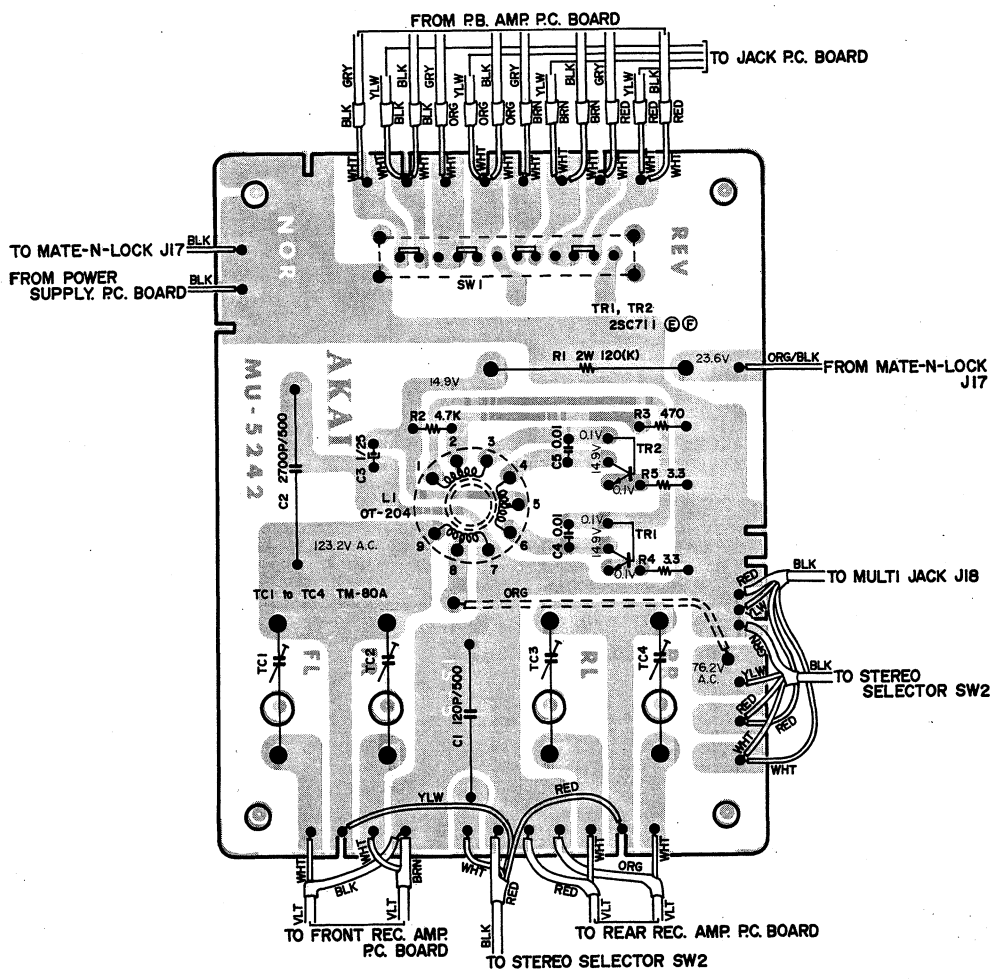
## 5. REC. AMP. P.C. BOARD MU-5238 (REAR)



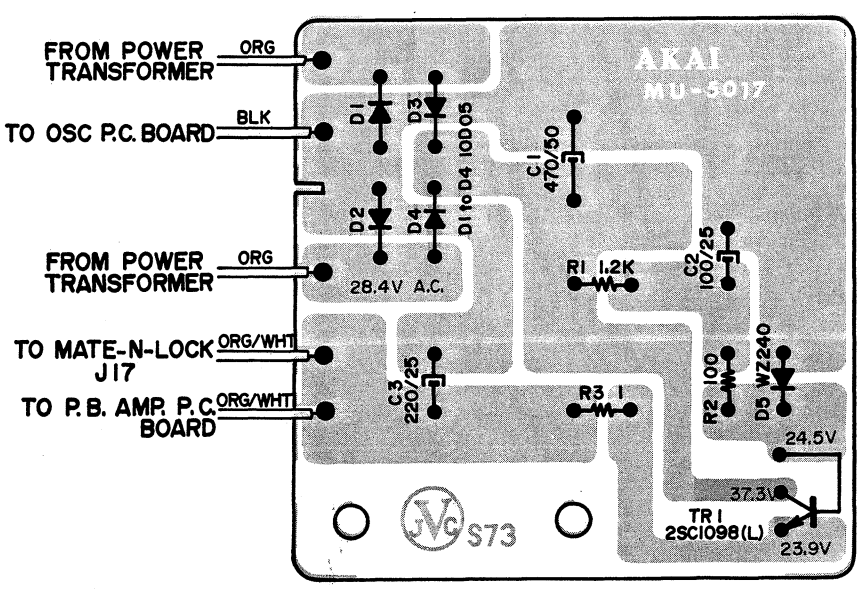

## 6. EQ. P.C. BOARD MU-5241



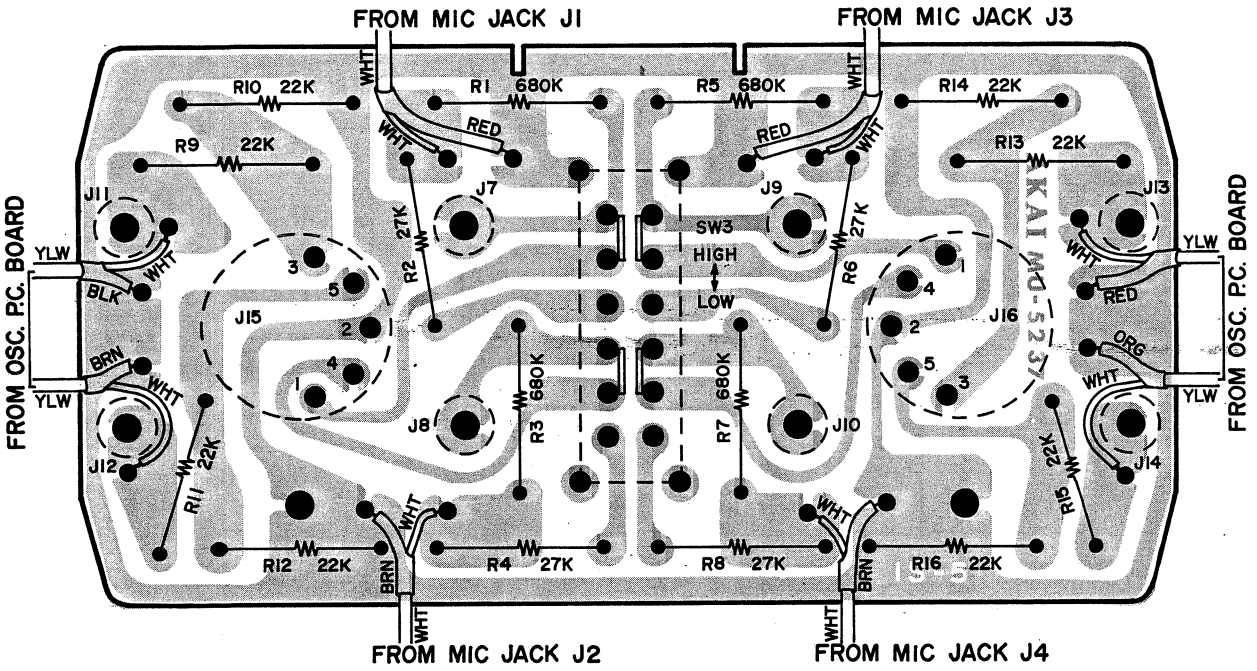
## 7. OSC. P.C. BOARD MU-5242




## 8. POWER SUPPLY P.C. BOARD MU-5017



## 9. JACK P.C. BOARD MU-5237



SECTION 2

# PARTS LIST

## TABLE OF CONTENTS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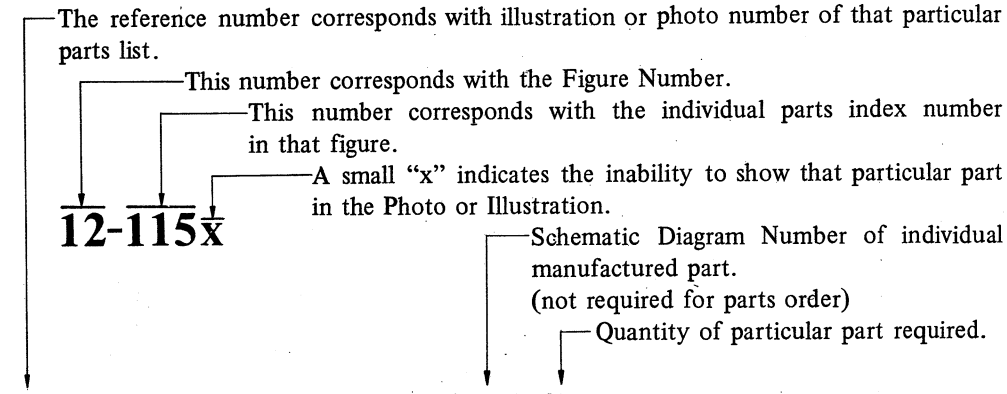
## HOW TO USE THIS PARTS LIST

1. This parts list is compiled by various individual blocks based on assembly process.
2. When ordering parts, please describe parts number, serial number, and model number in detail.
3. How to read list.


The reference number corresponds with illustration or photo number of that particular parts list.
This number corresponds with the Figure Number.
This number corresponds with the individual parts index number in that figure.
A small "x" indicates the inability to show that particular part in the Photo or Illustration.
12-115x
Schematic Diagram Number of individual manufactured part.
(not required for parts order)
Quantity of particular part required.

| Ref. No. | Parts No. | Description | Schematic No. | Q'ty |
|---|---|---|---|---|
| | | **FLYWHEEL BLOCK #13** | | |
| 12-115x | 800425 | Flywheel Block Assy. Comp. | RDG#13 | 1 |
| 12-116 | 244506 | Flywheel Only | RD-233 | 1 |
| 12-117x | 244754 | Felt, Flywheel | RD-275 | 1 |
| 12-118 | 251324 | Main Metal Case | RD-236 | 1 |
| 12-119 | 253080 | Main Metal | RD-237 | 1 |

4. The symbol numbers shown on the P.C. Board list can be matched with the Composite Views of components of the Schematic Diagram or Service Manual.
5. The indications of Resistors and Capacitors in the photos of P.C. Board are being eliminated.
6. The shape of the parts and parts name, etc. can be confirmed by comparing them with the parts shown on the Electrical Parts Table of P.C. Board.
7. Both the kind of part and installation position can be determined by the Parts Number. To determine where a parts number is listed, utilize Parts Index at end of Parts List.
   It is necessary first of all to find the Parts Number. This can be accomplished by using the Reference Number listed at right of parts number in the Parts Index. (meaning of ref. no. outlined in Item 3 above).
8. Utilize separate "Price List for Parts" to determine unit price. The most simple method of finding parts Price is to utilize the reference number.

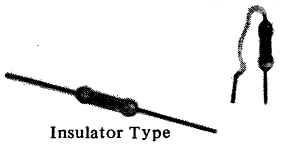
# ELECTRICAL PARTS TABLE

Because the indication of resistors and capacitors in the P. C. Board photos are being eliminated, please confirm parts name and shape by comparing them with the parts shown in this table.

1

Solid Resistor

2 Stopper Type



Insulator Type

Carbon Resistor

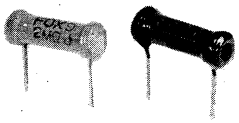
3

Metal Oxide Film Resistor

4

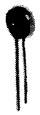
Cement Resistor

5



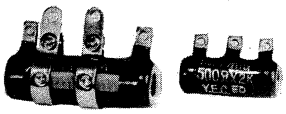
Wire-Wound Resistor

6



Thermister

7



Enamel Resistor

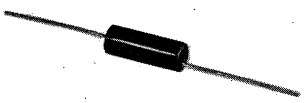
1

MP Capacitor (Tubular Type)

2

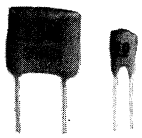
Plastic Capacitor

3



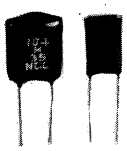
Mylar Capacitor

4



VFM (Hi-Q) Capacitor

5



Mylar Capacitor

6

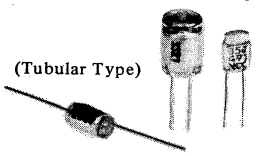
Tantalum Capacitor

7

Oil Capacitor (Tubular Type)

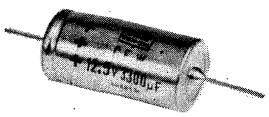
8 Vertical Type

(Tubular Type)



Styrol Capacitor

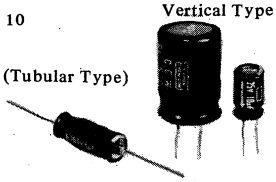
9



Electrolytic Capacitor (Tubular Type)

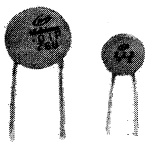
10 Vertical Type

(Tubular Type)



Electrolytic Capacitor

11



Ceramic Capacitor

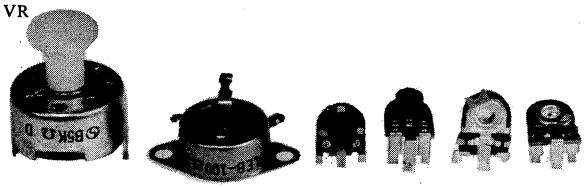
12

Metalized Mylar (Paper) Capacitor

13

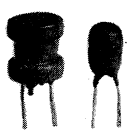
Trimmer Condenser

VR



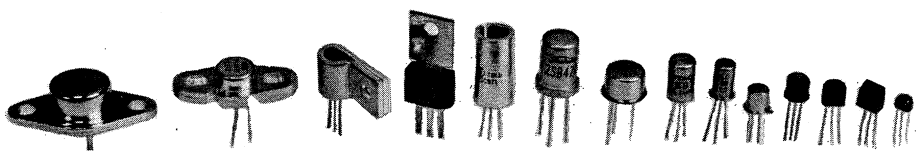
Semi-Fixed Volume

L



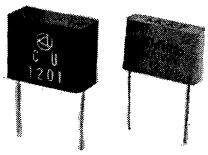
Ferri Inductor

TR



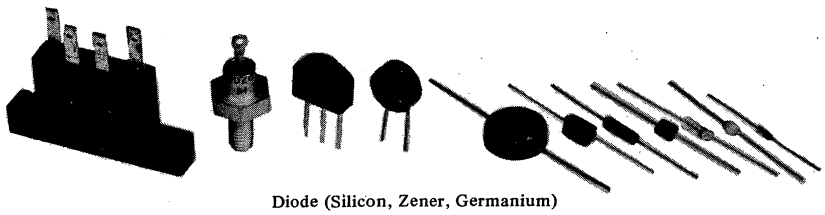
Transistor

CR



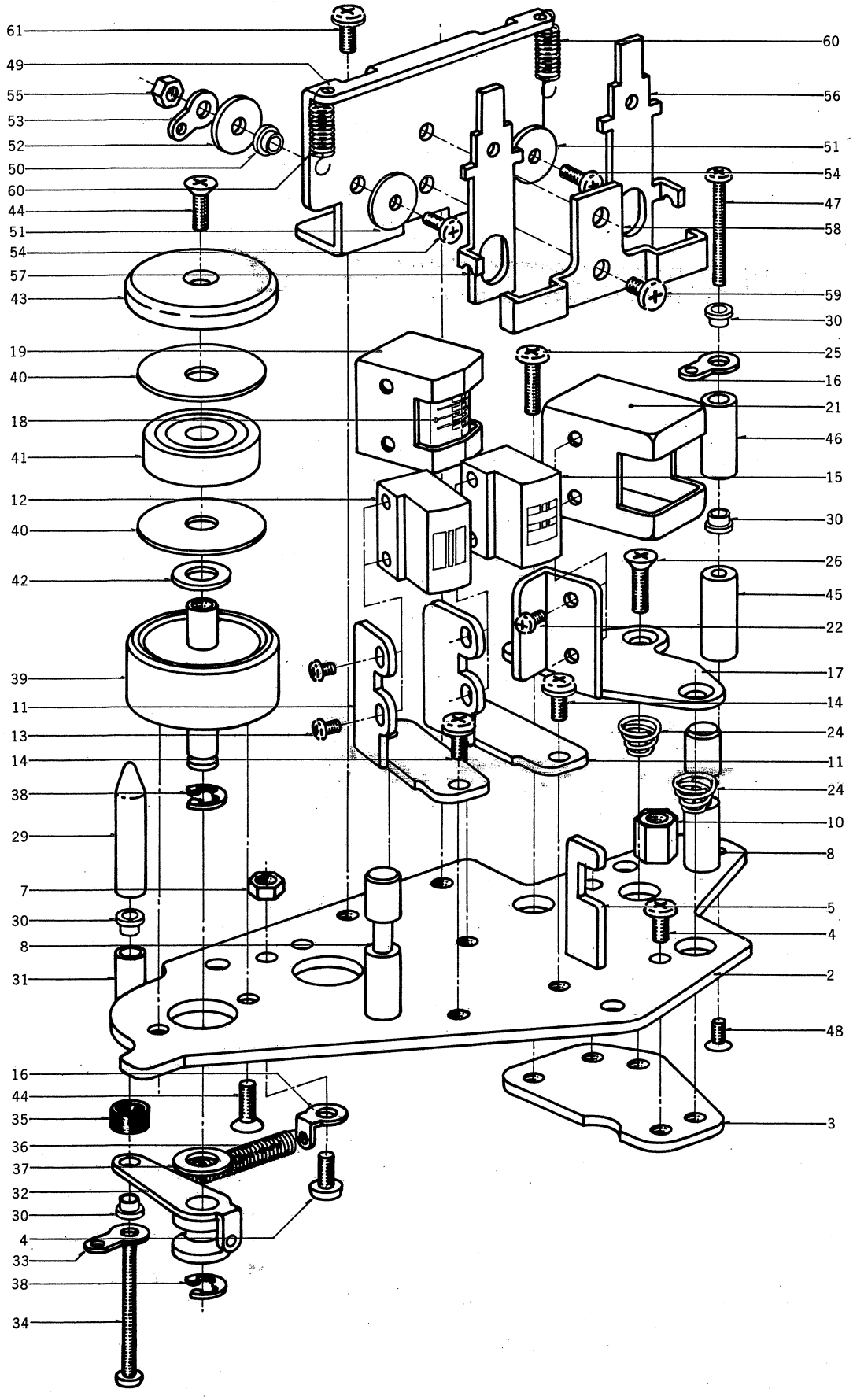
Spark Quencher

D



Diode (Silicon, Zener, Germanium)

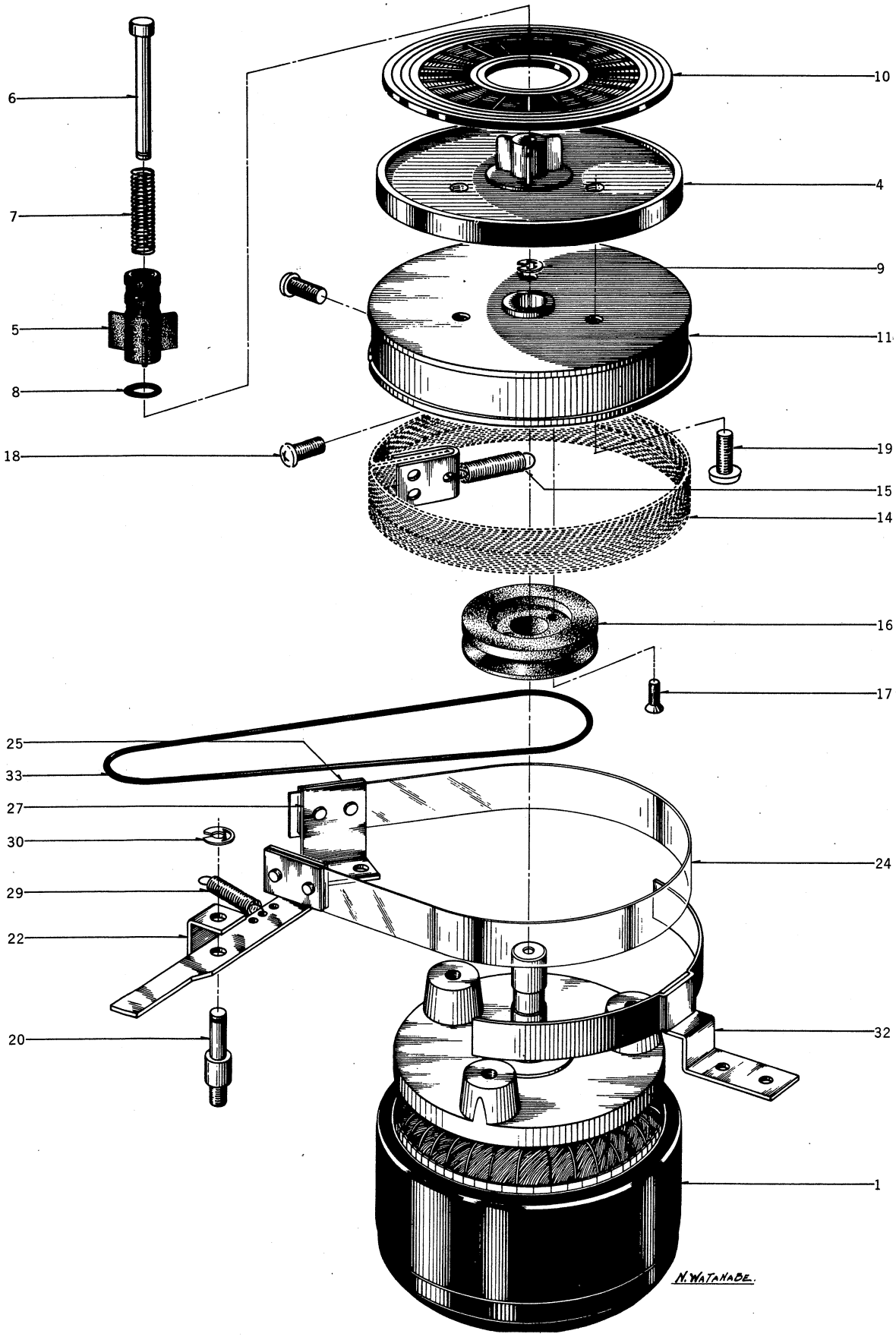
FIG. 1 ILLUSTRATION OF HEAD BLOCK



## HEAD BLOCK

| Ref. No. | Parts No. | Description | Schematic No. | Q'ty |
|---|---|---|---|---|
| 1-1x | BH563545 | Head Block Comp. | MU-2 | 1 |
| 1-2 | HZ548717 | Head Base | MU-0201 | 1 |
| 1-3 | HZ548291 | Head Base Support | MU-0202 | 1 |
| 1-4 | ZS413155 | Screw, binding head 3x6 | | 4 |
| 1-5 | HZ274162 | Tape Guide #1 | 4TR-5 | 1 |
| 1-6x | ZW273802 | Toothed Lock Washer M3 | | 2 |
| 1-7 | ZW273756 | Nut M3 | | 2 |
| 1-8 | HZ317597 | Tape Guide A, MR | MR-4 | 2 |
| 1-9x | ZS200384 | Screw, countersunk head 3x6 | | 1 |
| 1-10 | HZ541170 | Panel Support | MC-0209 | 1 |
| 1-11 | HZ410984 | Erase Head Base | LF-0002 | 2 |
| 1-12 | HE552914 | ERASE HEAD EF-210 | | 1 |
| 1-13 | ZS201475 | Screw, pan head 2x3 | | 4 |
| 1-14 | ZS403301 | Screw, binding head 3x6, w/washer | | 5 |
| 1-15 | HE563220 | ERASE HEAD E4-260 | | 1 |
| 1-16 | ZW273778 | Earth Lug M3 | | 3 |
| 1-17 | HA445116 | P.B. Head Angle | DF-0002 | 1 |
| 1-18 | HP412165 | P.B. HEAD P4-50 | | 1 |
| 1-19 | HZ411085 | 4QP Shield Case | LF-0014 | 1 |
| 1-20x | HZ411074 | 4QP Back-shield | LF-0013 | 1 |
| 1-21 | HZ411017 | Head Shield Case | LF-0005 | 1 |
| 1-22 | ZS201508 | Screw, pan head 2x4 | | 2 |
| 1-23x | EZ437736 | Head Terminal Plate (LF) | LF-0028 | 1 |
| 1-24 | ZG396538 | Cone Spring | KD-0010 | 3 |
| 1-25 | ZS345914 | Screw, round head 3x10 | | 1 |
| 1-26 | ZS455231 | Screw, countersunk head 3x10 | | 2 |
| 1-27x | EA222096 | Connector P.C. Board | RD-140 | 1 |
| 1-28x | HZ411030 | Wire Fitting Metal | LF-0007 | 1 |
| 1-29 | HZ541181 | Sensing Post B | MC-0210 | 1 |
| 1-30 | HZ317632 | Insulator Collar A | MR-36 | 4 |
| 1-31 | HZ318047 | Sensing Collar A | MR-35 | 1 |
| 1-32 | HZ318036 | Tension Arm, w/pulley | MR-37 | 1 |
| 1-33 | ZW316800 | Earth Lug M2.6 | | 1 |
| 1-34 | ZS554962 | Screw, pan head 2.3x25 | | 1 |
| 1-35 | HZ467010 | Cushion Rubber, MC | MC-0004 | 1 |
| 1-36 | ZG317114 | Tension Lever Spring | MR-39 | 1 |
| 1-37 | ZW364803 | Washer (Nylon)D5.1x10.3x0.1t | | 1 |
| 1-38 | ZW270123 | 'E' Ring 4M | 6-1-9 | 2 |
| 1-39 | HZ547751 | Tape Guide Table A, w/shaft | MU-0015 | 1 |
| 1-40 | ZW231805 | Tape Guide Washer (large) | 3A-356 | 2 |
| 1-41 | MV248117 | Bearing 635AHZZMC1ERB32 | | 1 |
| 1-42 | ZW326463 | Washer (PBP)D5.1x10.3x0.2t | | 1 |
| 1-43 | HZ317092 | Tape Guide Table B | MR-32 | 1 |
| 1-44 | ZS414033 | Screw, countersunk head 3x8 | | 3 |
| 1-45 | HZ455962 | Sensing Collar B | MC-1019 | 1 |
| 1-46 | HZ455973 | Sensing Collar A | MC-1018 | 1 |
| 1-47 | ZS554916 | Screw, binding head 2.3x20 | | 1 |
| 1-48 | ZS558134 | Screw, countersunk head 2.3x5 | | 1 |
| | | **MECH. ASSEMBLY BLOCK** | | |
| 1-49 | ML544285 | DS. Table | MU-0011 | 1 |
| 1-50 | MZ316822 | Insulator Collar B | MR-225 | 2 |
| 1-51 | HZ542092 | Insulator Washer (Mylar) | MC-0213 | 2 |
| 1-52 | ZW563218 | Washer (Bake)D3.2x10x1t | | 2 |
| 1-53 | ZW316800 | Earth Lug M2.6 | | 2 |
| 1-54 | ZS464692 | Screw, binding head 2.3x6 | | 2 |
| 1-55 | ZW273688 | Nut M2.3 | | 2 |
| 1-56 | HL541168 | DS. Lever A | MC-0208A | 1 |
| 1-57 | HL542687 | DS. Lever B | MC-0208B | 1 |
| 1-58 | HL541157 | DS. Lever Support | MC-0207 | 1 |
| 1-59 | ZS417137 | Screw, binding head 3x4 | | 2 |
| 1-60 | ZG317777 | Pull Spring | MR-47 | 2 |
| 1-61 | ZS558101 | Screw, pan head 3x6, w/washer | | 2 |

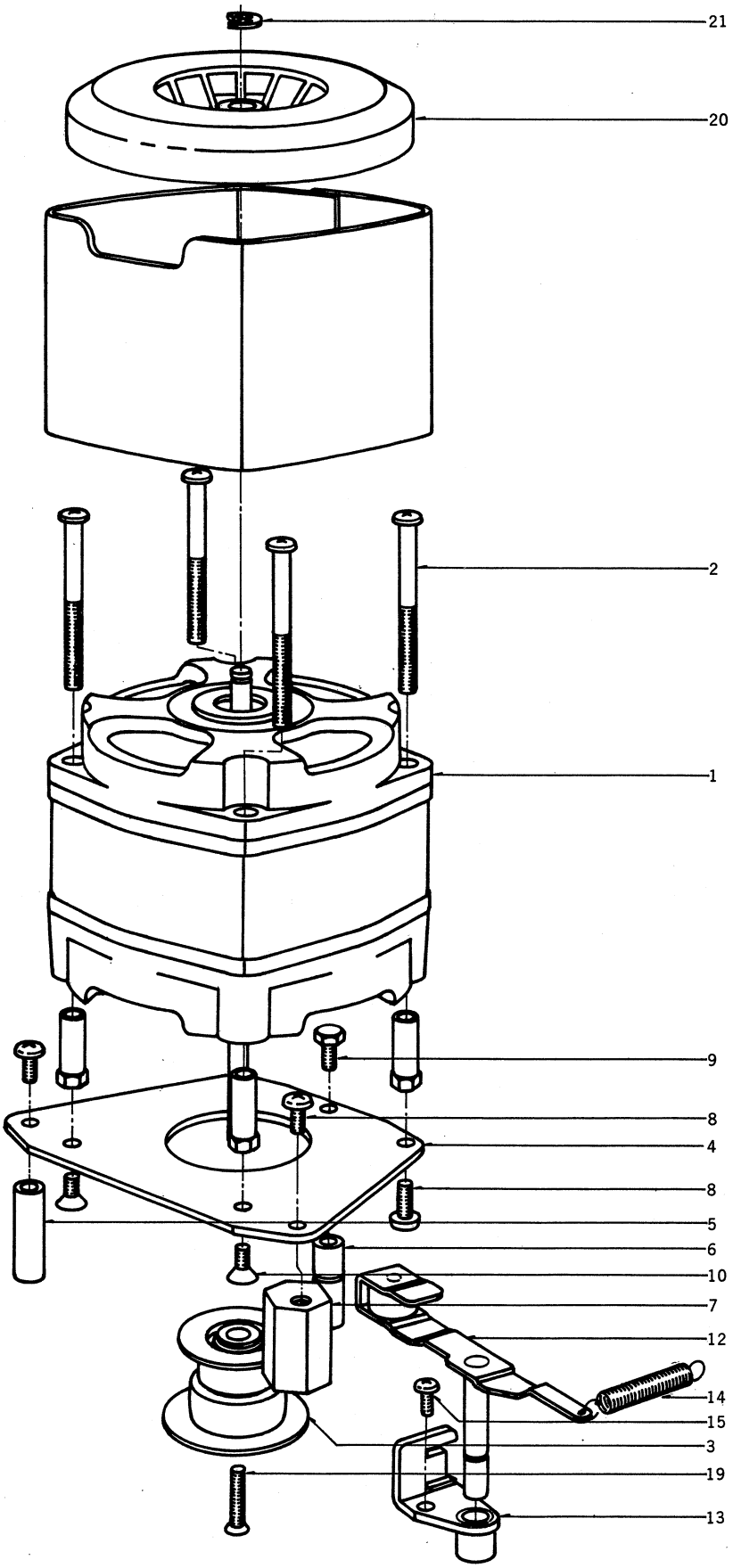
## FIG. 2 ILLUSTRATION OF REEL MOTOR & REEL TABLE BLOCK



## REEL MOTOR & REEL TABLE BLOCK

| Ref. No. | Parts No. | Description | Schematic No. | Q'ty |
|---|---|---|---|---|
| 2-1 | BM314741 | Reel Motor Block (24X0-2) Comp. | MC, MS, MR, KD | 1 |
| 2-2x | BR317395 | Supply Reel Table Comp. | MU, MC, MR | 1 |
| 2-3x | BR317384 | Take-up Reel Table Comp. | MU, MR | 1 |
| 2-4 | MT317441 | Reel Table, MR | MR-215 | 1 |
| 2-5 | MT255420 | Reel Retainer | 3R-102 | 1 |
| 2-6 | MS342000 | Reel Shaft | 3R-108 | 1 |
| 2-7 | ZG255633 | Reel Spring | 3R-109 | 1 |
| 2-8 | MT297663 | 3R 'O' Ring 2.9x1.65M | 3R-139 | 1 |
| 2-9 | ZW270088 | 'E' Ring 1.9M | 6-1-9 | 1 |
| 2-10 | MT317463 | Reel Table Rubber, MR | MR-250 | 1 |
| 2-11 | MT317452 | Brake Drum (R) (Take-up) | MR-216 | 1 |
| 2-12x | MT325473 | Brake Drum (L) (Supply) | MR-216 | 1 |
| 2-13x | ZW273778 | Earth Lug M3 | | 1 |
| 2-14 | MT436860 | Brake Cloth Comp. | MR-269 | 1 |
| 2-15 | ZG317496 | Felt Tension Spring | MR-260 | 1 |
| 2-16 | MR317507 | Counter Pulley (Take-up) | MR-217 | 1 |
| 2-17 | ZS365973 | Screw, countersunk head 2.3x12 | | 2 |
| 2-18 | ZS424056 | Screw, pan head 4x10 | | 2 |
| 2-19 | ZS413785 | Screw, binding head 3x12 | | 3 |
| | | **MECH. ASSEMBLY BLOCK** | | |
| 2-20 | MH317373 | Brake Lever Prop | MR-102 | 2 |
| 2-21x | ZW416698 | Nut M4 | | 2 |
| 2-22 | ML314976 | Brake Lever A (Take-up) | MR-210 | 1 |
| 2-23x | ML396810 | Brake Lever B (Supply) | KD-1038 | 1 |
| 2-24 | MT314987 | Brake Band | MR-213 | 2 |
| 2-25 | MZ314998 | Brake Band Retaining Plate | MR-212 | 4 |
| 2-26x | ZS417137 | Screw, binding head 3x4 | | 6 |
| 2-27 | MZ315000 | Brake Band Support | MR-214 | 2 |
| 2-28x | ZS425981 | Screw, binding head 3x3 | | 2 |
| 2-29 | ZG315011 | Brake Lever Spring | MR-116 | 2 |
| 2-30 | ZW290283 | 'U' Ring 2.85M | 6-1-1 | 2 |
| 2-31x | ZS323728 | Screw, binding head 3x5 | | 8 |
| 2-32 | MZ317406 | Brake Band Guide, w/base | MR-120 | 2 |
| 2-33 | MB527556 | Counter Belt D93x1.5 | ND-1022 | 1 |

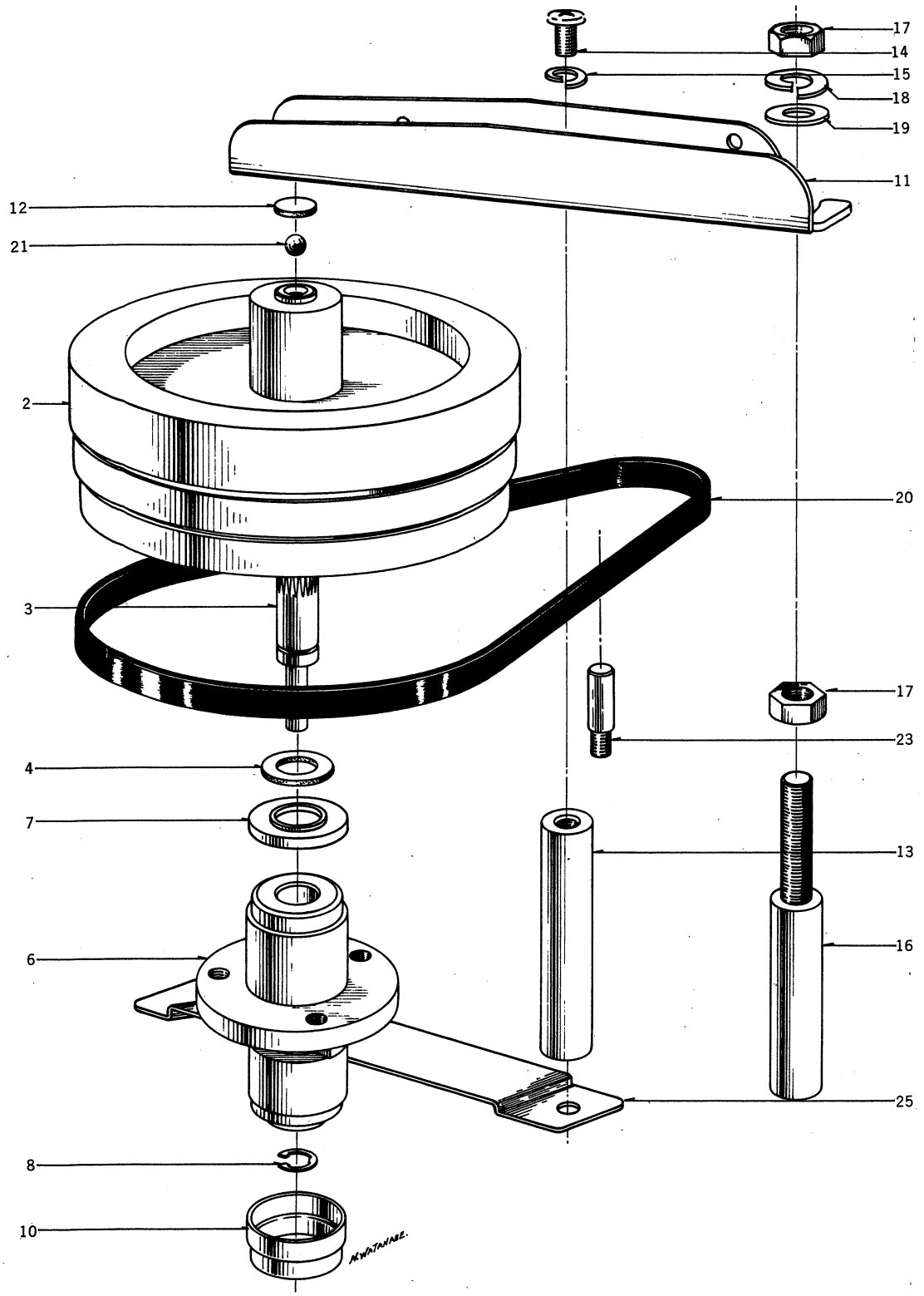
FIG. 3 ILLUSTRATION OF MAIN MOTOR BLOCK



## MAIN MOTOR BLOCK

| Ref. No. | Parts No. | Description | Schematic No. | Q'ty |
|---|---|---|---|---|
| | | **MAIN MOTOR BLOCK** | | |
| 3-1 | BM563196 | Main Motor Block (HM2-16MU) Comp. | MU | 1 |
| 3-2 | ZS427037 | Screw, pan head 4x50, w/washer | | 4 |
| 3-3 | MR540876 | Motor Pulley Comp. | MC-7201 | 1 |
| 3-4 | MZ316293 | Motor Mt. Plate, MR | MR-717 | 1 |
| 3-5 | MH254160 | Motor Prop A | 24X-730 | 1 |
| 3-6 | MZ254182 | Motor Prop B | 24X-731 | 1 |
| 3-7 | MH316304 | Motor Prop, MR | MR-706 | 1 |
| 3-8 | ZS424056 | Screw, pan head 4x10 | | 4 |
| 3-9 | ZS272395 | Motor Prop Retaining Screw, M-7 | 24X-732 | 1 |
| 3-10 | ZS427026 | Screw, countersunk head 4x10 | | 2 |
| | | **BELT CHANGE LEVER BLOCK** | | |
| 3-11x | BL555344 | Belt Change Lever Block Comp. | MU, MC-2 | 1 |
| 3-12 | ML540990 | Belt Change Lever, w/roller | MC-1207 | 1 |
| 3-13 | ML541001 | Belt Change Lever Stopper, w/metal | MC-1208 | 1 |
| 3-14 | ZG217337 | Belt Return Spring | 4TR-224 | 1 |
| 3-15 | ZS417150 | Screw, pan head 4x6 | | 1 |
| 3-16x | ZG217394 | Belt Change Spring B | MH-125 | 1 |
| 3-17x | ZW260054 | Washer (SUP)D6.1x10x0.25t | | 1 |
| 3-18x | ZW290283 | 'U' Ring 2.85M | 6-1-1 | 1 |
| 3-19 | ZS203016 | Screw, oval countersunk head 3x15 | | 1 |
| 3-20 | SZ529108 | Main Motor Fan | ND-7010 | 1 |
| 3-21 | ZW270134 | 'E' Ring 5M | 6-1-9 | 1 |

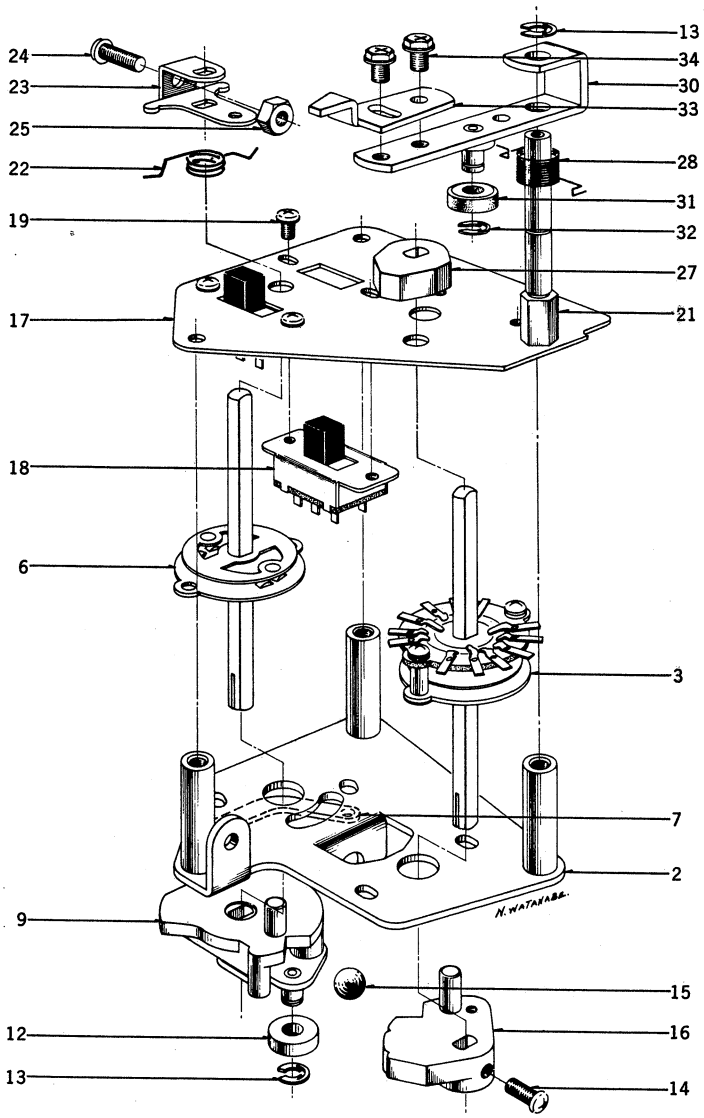
## FIG. 4 ILLUSTRATION OF FLYWHEEL BLOCK



## FLYWHEEL BLOCK

| Ref. No. | Parts No. | Description | Schematic No. | Q'ty |
|---|---|---|---|---|
| 4-1x | BF476550 | Flywheel Block Comp. | MS-2, 3, MR-2 | 1 |
| 4-2 | MI296245 | Flywheel 24 | MH-202 | 1 |
| 4-3 | MS476572 | Main Shaft, D6 | MR-2005 | 1 |
| 4-4 | ZW447208 | Flywheel Thrust B D7.9x13x0.5t | 101025 | 1 |
| 4-5x | ZS373577 | Set Screw, hexagon socket 5x6(flat) | | 2 |
| 4-6 | MZ296256 | Main Case A 24, w/metal | MH-206 | 1 |
| 4-7 | MZ446635 | Thrust Cap, Main Metal B2 | LF-2006 | 1 |
| 4-8 | MH244710 | Flywheel Fixing Pin | 900-250 | 1 |
| 4-9x | MZ244113 | Felt D12.5x16x2t | | 1 |
| 4-10 | MZ253113 | Main Metal Cap B | MH-208 | 1 |
| | | **MECH. ASSEMBLY BLOCK** | | |
| 4-11 | MZ314897 | Flywheel Support Plate, MR | MR-121 | 1 |
| 4-12 | ZW392681 | Washer (Nylon)D8x1t (without hole) | | 1 |
| 4-13 | MH273036 | Flywheel Prop A, M-9 | M9-310 | 1 |
| 4-14 | ZS413201 | Screw, pan head 4x8 | | 1 |
| 4-15 | ZW273914 | Spring Washer M4 | | 3 |
| 4-16 | MH273047 | Flywheel Prop B, M-9 | M9-311 | 1 |
| 4-17 | ZW413280 | Inch Nut 1/4" mountain 20 | | 2 |
| 4-18 | ZW393232 | Spring Washer 1/4" | | 1 |
| 4-19 | ZW413998 | Washer (SUP)D6.8x12.7x1t | | 1 |
| 4-20 | MB541012 | Drive Belt (flat) D116.9x1.6x7 | MC-1209 | 1 |
| 4-21 | MV269965 | Steel Ball D4 | | 1 |
| 4-22x | ZS424056 | Screw, pan head 4x10 | | 2 |
| 4-23 | MH248343 | Belt Guide Pin | 4TR-109 | 1 |
| 4-24x | ZW416698 | Nut M4 | | 1 |
| 4-25 | MZ439525 | Flywheel Belt Holding Plate B | MS-1014 | 1 |
| 4-26x | ZS439514 | Screw, binding head 3x18 | | 1 |
| 4-27x | ZW273756 | Nut M3 | | 1 |

## FIG. 5 ILLUSTRATION OF SWITCH BLOCK

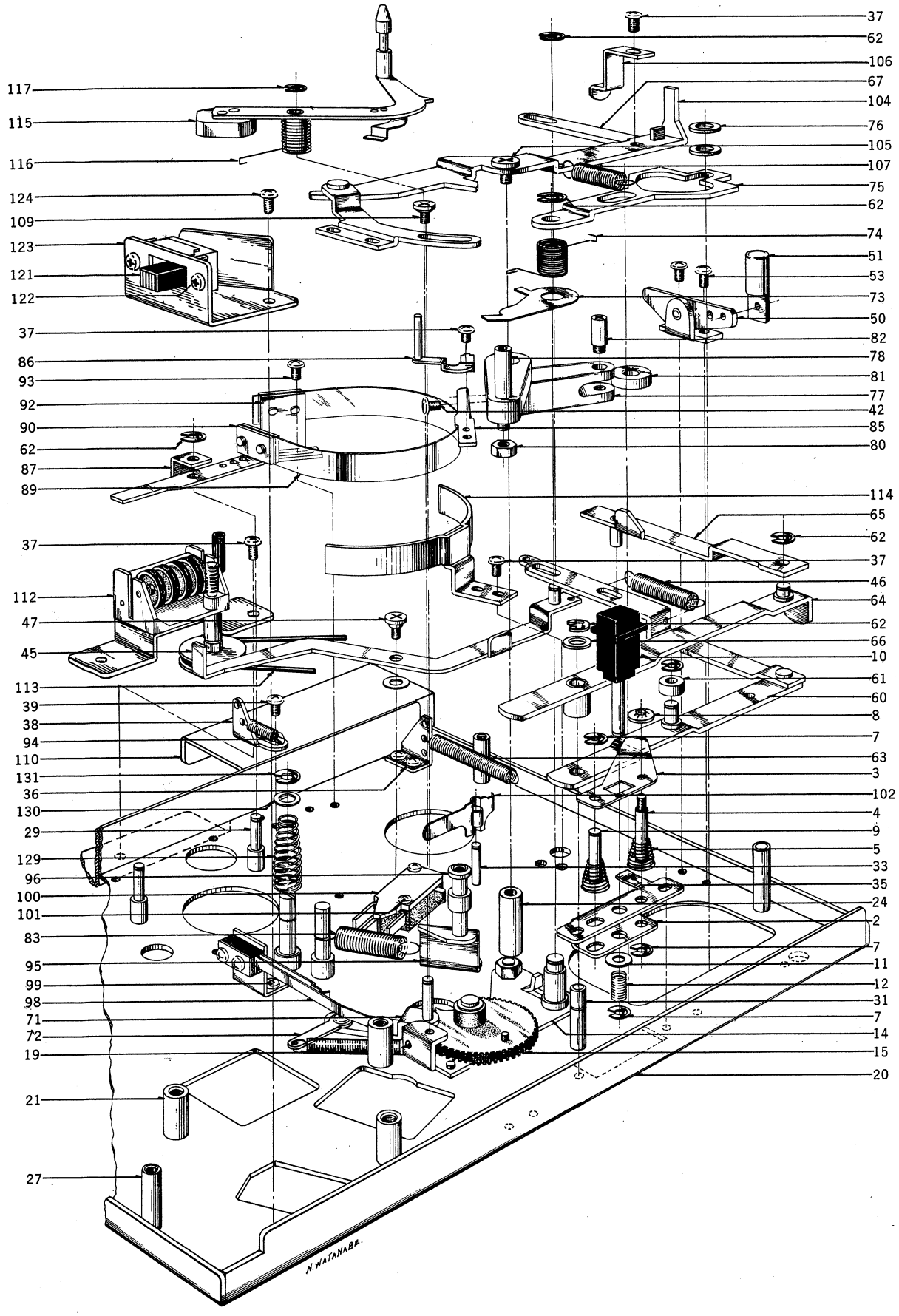



## SWITCH BLOCK

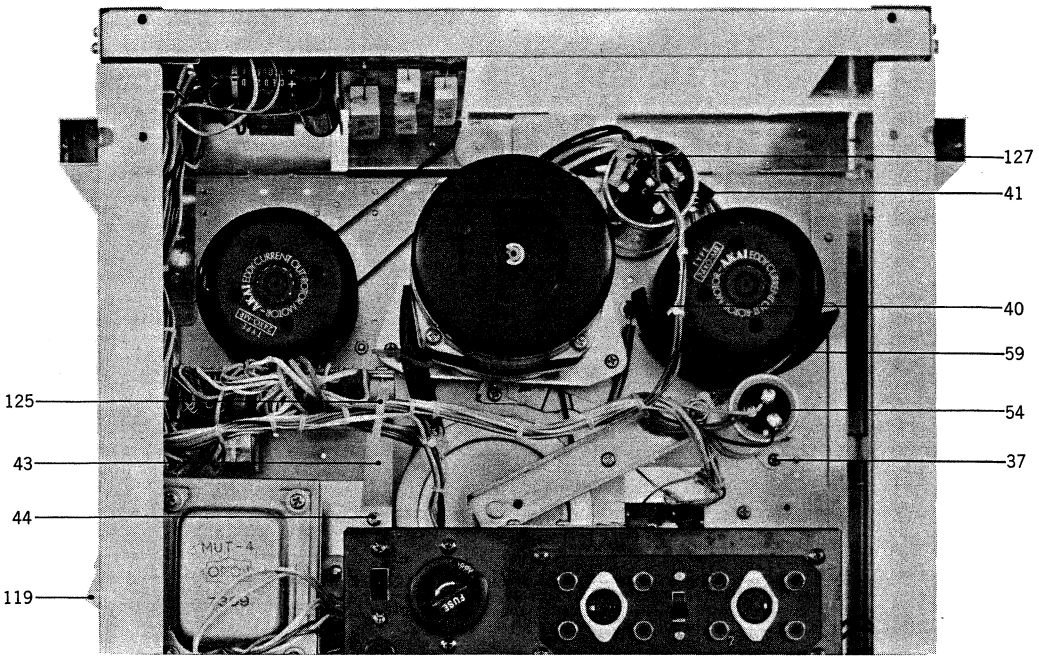
| Ref. No. | Parts No. | Description | Schematic No. | Q'ty |
|---|---|---|---|---|
| | | **SWITCH BLOCK** | | |
| 5-1x | BS558336 | Switch Block Comp. | MU-1, 2 | 1 |
| 5-2 | HZ402390 | SW. Table A-2, MR (w/prop) | MR-201 | 1 |
| 5-3 | ES316923 | Play Shaft (Y type) Y-133 | 25-8-6 | 1 |
| 5-4x | ZW273802 | Toothed Lock Washer M3 | | 2 |
| 5-5x | ZW273756 | Nut M3 | | 2 |
| 5-6 | ES316934 | Rewind Shaft (Y type) | 25-8-5 | 1 |
| 5-7 | MZ316945 | Nut Plate | MR-245 | 1 |
| 5-8x | ZS413728 | Screw, binding head 3x6, w/washer | | 2 |
| 5-9 | MZ316956 | Cam A-3 | MR-242 | 1 |
| 5-10x | ZW259942 | Washer (Fiber)D5.1x10.3x0.5t | | 1 |
| 5-11x | ZW376402 | Washer (Fiber)D5.1x10.3x1t | | 2 |
| 5-12 | MR269730 | Cam Roller D12 | 900-213 | 1 |
| 5-13 | ZW290283 | 'U' Ring 2.85M | 6-1-1 | 2 |
| 5-14 | ZS413201 | Screw, pan head 4x8 | | 3 |
| 5-15 | MV270066 | Steel Ball D8 | | 1 |
| 5-16 | MZ405483 | Cam B-1, w/tap | 900-206 | 1 |
| 5-17 | MZ544364 | Countrol Chassis | MU-2001 | 1 |
| 5-18 | ES479485 | Slide SW. S-1 | 25-3-66 | 2 |
| 5-19 | ZS371856 | ISO Screw, binding head 3x5 | | 4 |
| 5-20x | ZS559045 | Screw, binding head 4x8, w/washer | | 2 |
| 5-21 | MH317046 | Rec. Lever Prop | MR-206 | 1 |
| 5-22 | ZG225516 | SW. Spring | MR-255 | 1 |
| 5-23 | MZ317024 | SW. Cam | MR-204 | 1 |
| 5-24 | ZS424056 | Screw, pan bead 4x10 | | 1 |
| 5-25 | ZW416698 | Nut M4 | | 1 |
| 5-26x | ZS323728 | Screw, binding head 3x5 | | 3 |
| 5-27 | MZ317068 | Amp. SW. Cam B | MR-243 | 1 |
| 5-28 | ZG227564 | Spring H | 900-120 | 1 |
| | | **SWITCH LEVER BLOCK** | | |
| 5-29x | BL204480 | Switch Lever Block Comp. | #2-MR | 1 |
| 5-30 | ML226080 | SW. Lever A, w/shaft B | 900-255 | 1 |
| 5-31 | MR217203 | Cam Roller A (Nylon)D12 | 900-153 | 1 |
| 5-32 | ZW290283 | 'U' Ring 2.85M | 6-1-1 | 1 |
| 5-33 | ML226124 | SW. Lever B | 900-256 | 1 |
| 5-34 | ZS437545 | Hexagon Bolt 4x7, w/washer | | 2 |
| 5-35x | MZ256814 | Rewind Shaft Spacer | M9-124 | 2 |

**When ordering parts, please describe Parts Number, Serial Number, and Model Number in detail.**

## FIG. 6a ILLUSTRATION OF MECHANISM ASSEMBLY BLOCK



## FIG. 6b PHOTO OF MECHANISM ASSEMBLY BLOCK



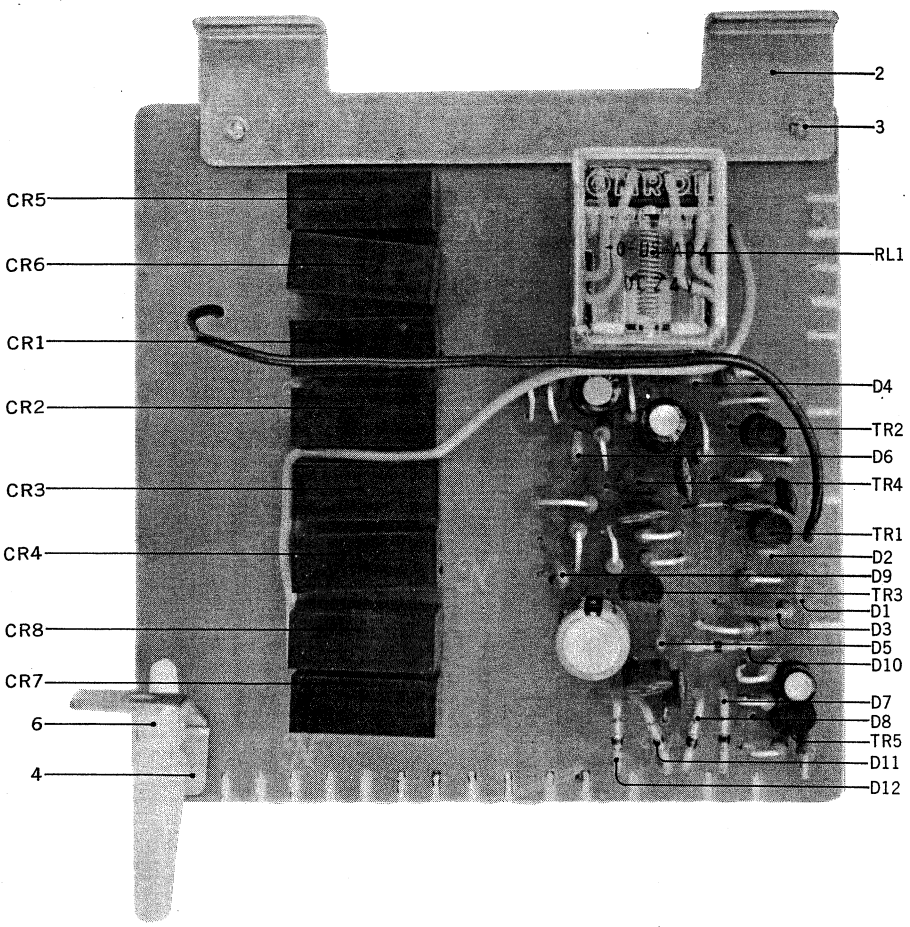

## MECHANISM ASSEMBLY BLOCK

| Ref. No. | Parts No. | Description | Schematic No. | Q'ty |
|---|---|---|---|---|
| | | **REC. BUTTON BLOCK** | | |
| 6-1x | BZ558347 | Rec. Button Block Comp. | MU-1, 2 | 1 |
| 6-2 | MZ316708 | Stopper Table | MR-219 | 1 |
| 6-3 | MZ316710 | Cam Stopper | MR-220 | 1 |
| 6-4 | MS316721 | Stopper Shaft | MR-221 | 1 |
| 6-5 | ZG316732 | Cone Spring | MR-244 | 2 |
| 6-6x | ZW322525 | Washer (PBP)D4.1x7x0.2t | | 1 |
| 6-7 | ZW290283 | 'U' Ring 2.85M | 6-1-1 | 4 |
| 6-8 | ZW432944 | Push Nut 3x10x0.3t | | 1 |
| 6-9 | MS316776 | Stopper Shaft B | MR-259 | 1 |
| 6-10 | SK543857 | Rec. Button B | MR-222 | 1 |
| 6-11 | ZW419646 | Washer (SPC)D4.5x9.8x0.5t | | 1 |
| 6-12 | ZG316765 | Rec. Button Spring | MR-252 | 1 |
| | | **ECCENTRIC GEAR BLOCK** | | |
| 6-13x | BZ248027 | Eccentric Gear Block Comp. | MC, MS, M9, MR | 1 |
| 6-14 | MZ248016 | Eccentric Gear Table, w/shaft | 4TR-243 | 1 |
| 6-15 | MZ248005 | Eccentric Gear | 4TR-245 | 1 |
| 6-16x | ZW861344 | Washer (PBP)D6.1x10x0.4t | | 1 |
| 6-17x | ZW260144 | Washer (Nylon)D6.1x10x0.3t | | 1 |
| 6-18x | ZW290283 | 'U' Ring 2.85M | 6-1-1 | 1 |
| 6-19 | ZG437253 | Eccentric Gear Return Spring | MS-2022 | 1 |
| | | **MECH. ASSEMBLY BLOCK** | | |
| 6-20 | MZ317340 | MR Mech. Frame, w/pin | MR-101 | 1 |
| 6-21 | MH247533 | Head Prop E | 100012 | 3 |
| 6-22x | ZS413201 | Screw, pan head 4x8 | | 2 |
| 6-23x | ZS414044 | Screw, countersunk head 4x8 | | 1 |
| 6-24 | MS317362 | Pinch Roller Arm Shaft | MR-125 | 1 |
| 6-25x | ZW274026 | Spring Washer M5 | | 1 |
| 6-26x | ZW413278 | Nut M5 | | 1 |
| 6-27 | MH273295 | Mech. Panel Prop, M-9 | M9-302 | 2 |
| 6-28x | ZS421806 | Screw, pan head 3x8 | | 2 |
| 6-29 | MH317373 | Brake Lever Prop | MR-102 | 2 |
| 6-30x | ZW416698 | Nut M4 | | 2 |
| 6-31 | MS260515 | A Lever Shaft | 900-126 | 1 |
| 6-32x | ZW413267 | Flange Nut M4 | | 1 |
| 6-33 | MS250536 | Micro Lever Shaft | 3A-239 | 1 |
| 6-34x | ZW273688 | Nut M2.3 | | 1 |
| 6-35 | MZ217697 | Pause Lever Stopper Plate | M9-113 | 1 |
| 6-36 | MZ227340 | Spring Rack B | 900-172 | 1 |
| 6-37 | ZS323728 | Screw, binding head 3x5 | | 21 |
| 6-38 | MZ314605 | Spring Rack, MR | MR-104 | 2 |
| 6-39 | ZS425981 | Screw, binding head 3x3 | | 4 |
| 6-40 | ZS413212 | Screw, binding head 3x5, w/lug | | 1 |
| 6-41 | EC520626 | MP/C. (3+1)μFx2 250WVAC (Lug type) | 24-9-74 | 1 |
| 6-42 | ZS413223 | Screw, binding head 3x5, w/washer | | 6 |
| 6-43 | MZ544331 | P.C. Board Holder B | MU-1004 | 1 |
| 6-44 | ZS413155 | Screw, binding head 3x6 | | 2 |
| 6-45 | ML314684 | Brake Lever C, w/pin | MR-227 | 1 |
| 6-46 | ZG314706 | Spring IB | MR-115 | 1 |
| 6-47 | ZS314717 | Graduated Screw, MR | MR-254 | 1 |
| 6-48x | ZW432347 | Washer (Luminar) D6.2x13x0.125t | | 1 |
| 6-49x | ZW273756 | Nut M3 | | 1 |
| 6-50 | ML226258 | Start Lever A, w/lever B-2 | 4TR-122 | 1 |
| 6-51 | SB425777 | Start Button D | MS-1002 | 1 |
| 6-52x | ZW314728 | Cotter Pin 1.6x8 | | 1 |
| 6-53 | ZS425788 | Screw, round head 3x4 | | 2 |
| 6-54 | EC442056 | MP/C. 2+1μF 250WVAC (Lug type) | 24-9-61 | 1 |
| 6-55x | ZW330412 | Adjust Washer (U) D4x13x0.13t | | 1 |
| 6-56x | ZW330423 | Adjust Washer (U) D4x13x0.25t | | 1 |
| 6-57x | ZW330434 | Adjust Washer (U) D4x13x0.5t | | 1 |
| 6-58x | ZW330445 | Adjust Washer (U) D4x13x0.8t | | 1 |
| 6-59 | MZ314673 | Reel Motor Shield | MR-123 | 1 |
| 6-60 | ML314763 | Lever B, MR (w/lever D) | MR-122 | 1 |
| 6-61 | MR314785 | Cam Roller D9 | MR-237 | 1 |
| 6-62 | ZW290283 | 'U' Ring 2.85M | 6-1-1 | 9 |
| 6-63 | ZG314818 | D Lever Spring | MR-114 | 1 |
| 6-64 | ML334506 | Lever A, MR (w/metal) | MR-126 | 1 |
| 6-65 | ML314842 | C Lever, MR (w/pin) | MR-108 | 1 |
| 6-66 | ZW419826 | Washer (Fiber)D6.2x10x1t | | 2 |
| 6-67 | ML314864 | IB Lever | MR-111 | 1 |
| 6-68x | ZW259705 | Washer (BSP)D4.1x13x1t | | 1 |
| 6-69x | ZS207314 | Amp. Lever Set Screw | 3A-737 | 1 |
| 6-70x | ZW259885 | Washer (PBP)D5.1x10.3x0.1t | | 1 |
| 6-71 | MZ260662 | AS Lever Prop Base, w/prop | 4TR-236 | 1 |
| 6-72 | ZS202116 | Screw, binding head 3x5, w/lug | | 1 |
| 6-73 | MZ218125 | Gear Stopper | 4TR-120 | 1 |
| 6-74 | ZG226697 | Stopper Gear | 4TR-121 | 1 |
| 6-75 | ML228868 | Auto. Mech. Control Lever | 4TR-125 | 1 |

**When ordering parts, please describe Parts Number, Serial Number, and Model Number in detail.**

| Ref. No. | Parts No. | Description | Schematic No. | Q'ty |
|---|---|---|---|---|
| 6-76 | ZW260087 | Washer (Fiber)D6.1x10x0.5t | | 1 |
| 6-77 | ML314932 | Pinch Roller Lever, MR | MR-119 | 1 |
| 6-78 | MS243404 | Pinch Roller Shaft C | 4TR-102 | 1 |
| 6-79x | ZW259975 | Washer (SUP)D5.1x10.3x0.8t | | 1 |
| 6-80 | ZW416698 | Nut M4 | | 1 |
| 6-81 | MR269763 | Cam Roller D13 | 900-154 | 1 |
| 6-82 | MS582906 | Cam Roller Shaft A-1 | 7-3-6 | 1 |
| 6-83 | ZG455692 | Pinch Roller Spring, MS | MS-1015 | 1 |
| 6-84x | ZW314943 | Washer (Nylon)D8 | MR-113 | 1 |
| 6-85 | ML314954 | Shifter Lever A | MR-117 | 1 |
| 6-86 | ML549213 | Shifter Lever B, w/pin | MC-1215 | 1 |
| 6-87 | ML314976 | Brake Lever A (Take-up) | MR-210 | 1 |
| 6-88x | ML396810 | Brake Lever B (Supply) | KD-1038 | 1 |
| 6-89 | MT314987 | Brake Band | MR-213 | 2 |
| 6-90 | MZ314998 | Brake Band Retaining Plate | MR-212 | 4 |
| 6-91x | ZS417137 | Screw, binding head 3x4 | | 6 |
| 6-92 | MZ315000 | Brake Band Support | MR-214 | 2 |
| 6-93 | ZS425981 | Screw, binding head 3x3 | | 2 |
| 6-94 | ZG315011 | Brake Lever Spring | MR-116 | 2 |
| 6-95 | HZ315077 | Reverse Guide Base, w/prop | MR-229 | 1 |
| 6-96 | HZ315090 | Reverse Guide | RD-225 | 1 |
| 6-97x | ZS344463 | Set Screw, hexagon socket 4x6(cup) | | 1 |
| 6-98 | ES546794 | Tension SW. Comp. MU | MU-1012 | 1 |
| 6-99 | ZS427048 | Screw, round head 3x3 | | 2 |
| 6-100 | ES562465 | Micro SW. K-1 | 25-1-26 | 1 |
| 6-101 | ZS417148 | Screw, binding head 3x15 | | 2 |
| 6-102 | ML316394 | Operation SW. Lever | MR-112 | 1 |
| 6-103x | ZW270088 | 'E' Ring 1.9M | 6-1-9 | 1 |
| 6-104 | ML316427 | Pause Lever, MR (w/lever B) | MR-233 | 1 |
| 6-105 | ZS217877 | Pause Lever Set Screw | 900-136 | 1 |
| 6-106 | MZ316451 | Pause Stopper, M-7 | MH-126 | 1 |
| 6-107 | ZG301061 | Pause Spring 990A | 4TR-128 | 1 |
| 6-108x | ZW260010 | Washer (PBP)D6.1x10x0.1t | | 1 |
| 6-109 | ZS207314 | Amp. Lever Set Screw | 3A-737 | 1 |
| 6-110 | MZ548728 | Frame Reinforcement Plate | MU-1201 | 1 |
| 6-111x | ZS563332 | Tapping Screw #2 4x6(binding) | | 2 |
| 6-112 | MC554826 | Counter MP-490-19 | 9-1-28 | 1 |
| 6-113 | MB527556 | Counter Belt D93x1.5 | ND-1022 | 1 |
| 6-114 | MZ317406 | Brake Band Guide, w/base | MR-120 | 2 |
| 6-115 | BL316484 | AS Lever Block Comp. | MU, MC, MS, MR | 1 |
| 6-116 | ZG260706 | AS Lever Spring | 4TR-118 | 1 |
| 6-117 | ZW290294 | 'U' Ring 2.85M | 6-1-1B | 1 |
| 6-118x | MP271170 | Pinch Roller, LC D=38 | LC-321 | 1 |
| 6-119 | EJ450573 | Mate-N-Lock Cap Housing 9P 1-480277-0 | 52-1-7 | 1 |
| 6-120x | EJ373623 | Pin Contact 61116-1 | 52-1-1 | 12 |
| 6-121 | ES375478 | Slide SW. ESD-279DU, w/knob(black) | 25-3-23 | 1 |
| 6-122 | ZS444273 | ISO Screw, binding head 3x4 | | 4 |
| 6-123 | ML544307 | SW. Retaining Plate S | MU-1001 | 1 |
| 6-124 | ZS413728 | Screw, binding head 3x6, w/washer | | 1 |
| 6-125 | EJ510333 | Wire Clip 220-JD481610-0104 (Nylon) | 2-7-17 | 1 |
| 6-126x | MZ219576 | Cord Retainer D | M9-123 | 1 |
| 6-127 | EJ205975 | Cramp Terminal 1-SD | 32-1-7 | 7 |
| 6-128x | EJ205986 | Cramp Terminal 2-SD | 32-1-8 | 1 |
| 6-129 | ZG217394 | Belt Change Spring B | MH-125 | 1 |
| 6-130 | ZW260054 | Washer (SUP)D6.1x10x0.25t | | 1 |
| 6-131 | ZW290283 | 'U' Ring 2.85M | 6-1-1 | 1 |

## FIG. 7 PHOTO OF SYSTEM CONTROL P.C. BOARD (MU-1202)



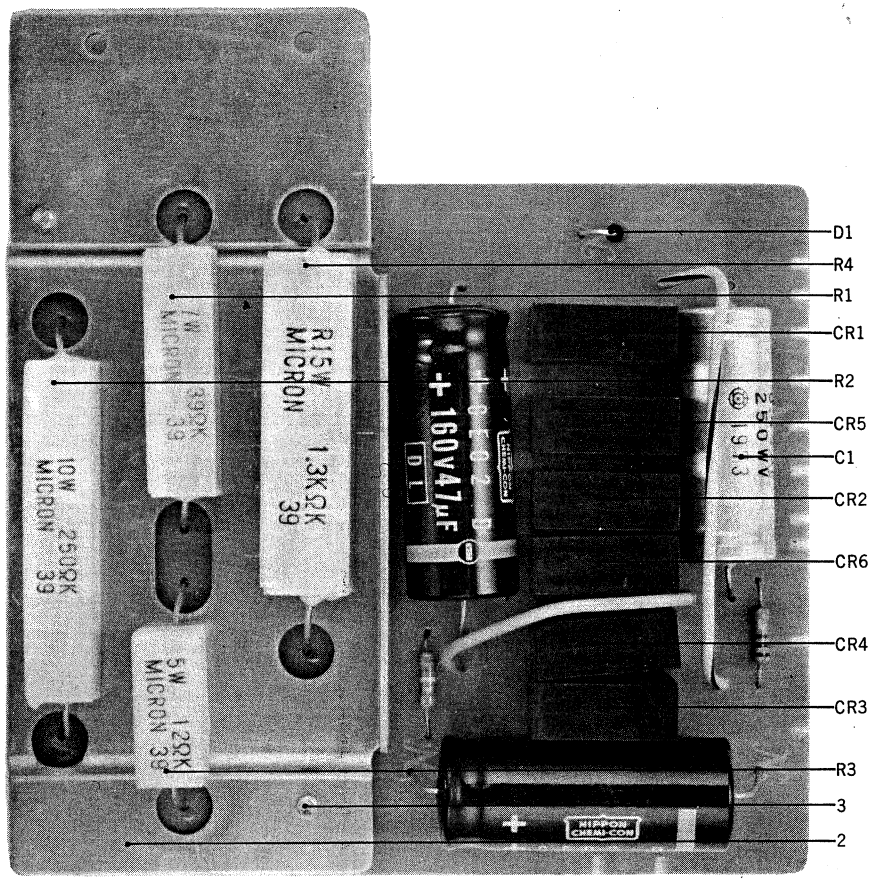

## SYSTEM CONTROL P.C. BOARD (MU-1202) BLOCK

| Symbol No. | Parts No. | Description | Q'ty |
|---|---|---|---|
| 7-1x | BA563567 | System Control P.C. Board Comp. (MU-1202) | 1 |
| 7-TR1to4 | ET398711 | Transistor 2SC945(Q)(R) | 4 |
| 7-TR5 | ET453486 | Transistor 2SC711(E)(F) | 1 |
| 7-D1, 2 | ED560913 | Silicon Diode 1S2473 VE | 2 |
| 7-D3 | ED219464 | Germanium Diode 1N34A | 1 |
| 7-D4 | ED536062 | Silicon Diode WG-713 | 1 |
| 7-D5, 6 | ED514721 | Silicon Diode WG-599 | 2 |
| 7-D7to12 | ED560913 | Silicon Diode 1S2473 VE | 6 |
| 7-RL1 | EP344136 | Relay MY4-O-US-AD4 24V | 1 |
| 7-CR1to8 | ER450786 | Spark Quencher U/L 0.1μ+120Ω 400WV | 8 |
| 7-2 | EZ544320 | P.C. Board Holder A | 1 |
| 7-3 | ZS447772 | Tapping Screw #2 3x6(BR) | 2 |
| 7-4 | MZ544331 | P.C. Board Holder B | 1 |
| 7-5x | ZS413155 | Screw, binding head 3x6 | 2 |
| 7-6 | EJ510333 | Wire Clip 220-JD481610-0104 (Nylon) | 1 |
| | | **Capacitor, Vertical Type** | |
| 7-C1 | EC220994 | Elect. 10μF 25WV | 1 |
| 7-C2 | EC383501 | Mylar 0.001μF(M) 50WV | 1 |
| 7-C3, 4 | EC250918 | Mylar 0.01μF(M) 50WV | 2 |
| 7-C5 | EC391498 | Mylar 0.022μF(M) 50WV | 2 |
| 7-C6 | EC220678 | Elect. 47μF 25WV | 1 |
| 7-C7 | EC391498 | Mylar 0.022μF(M) 50WV | 2 |
| 7-C8 | EC220994 | Elect. 10μF 25WV | 1 |
| 7-C9 | EC250885 | Mylar 0.01μF(K) 50WV | 1 |
| 7-C10 | EC450055 | Elect. 1μF 25WV | 1 |
| 7-C11 | EC220432 | Elect. 2.2μF 25WV | 1 |

| Symbol No. | Parts No. | Description | Q'ty |
|---|---|---|---|
| | | **Resistor, Stopper Type** | |
| 7-R1 | ER211667 | Carbon RD1/4 100(J) | 1 |
| 7-R2 | ER336442 | Carbon RD1/4 10k(J) | 1 |
| 7-R3 | ER212883 | Carbon RD1/4 4.7k(J) | 1 |
| 7-R4 | ER212477 | Carbon RD1/4 3.3k(J) | 1 |
| 7-R5 | ER211667 | Carbon RD1/4 100(J) | 1 |
| 7-R6, 7 | ER212883 | Carbon RD1/4 4.7k(J) | 2 |
| 7-R8 | ER336442 | Carbon RD1/4 10k(J) | 1 |
| 7-R9 | ER357456 | Carbon RD1/4 2.2k(J) | 1 |
| 7-R10 | ER211757 | Carbon RD1/4 100k(J) | 1 |
| 7-R11 | ER212264 | Carbon RD1/4 22k(J) | 1 |
| 7-R12 | ER212883 | Carbon RD1/4 4.7k(J) | 1 |
| 7-R13 | ER212264 | Carbon RD1/4 22k(J) | 1 |
| 7-R14 | ER357456 | Carbon RD1/4 2.2k(J) | 1 |
| 7-R15 | ER211667 | Carbon RD1/4 100(J) | 1 |
| 7-R16 | ER212264 | Carbon RD1/4 22k(J) | 1 |
| 7-R17, 18 | ER336442 | Carbon RD1/4 10k(J) | 2 |
| 7-R19 | ER342933 | Carbon RD1/4 27k(J) | 1 |
| 7-R20 | ER336442 | Carbon RD1/4 10k(J) | 1 |

**When ordering parts, please describe Parts Number, Serial Number, and Model Number in detail.**

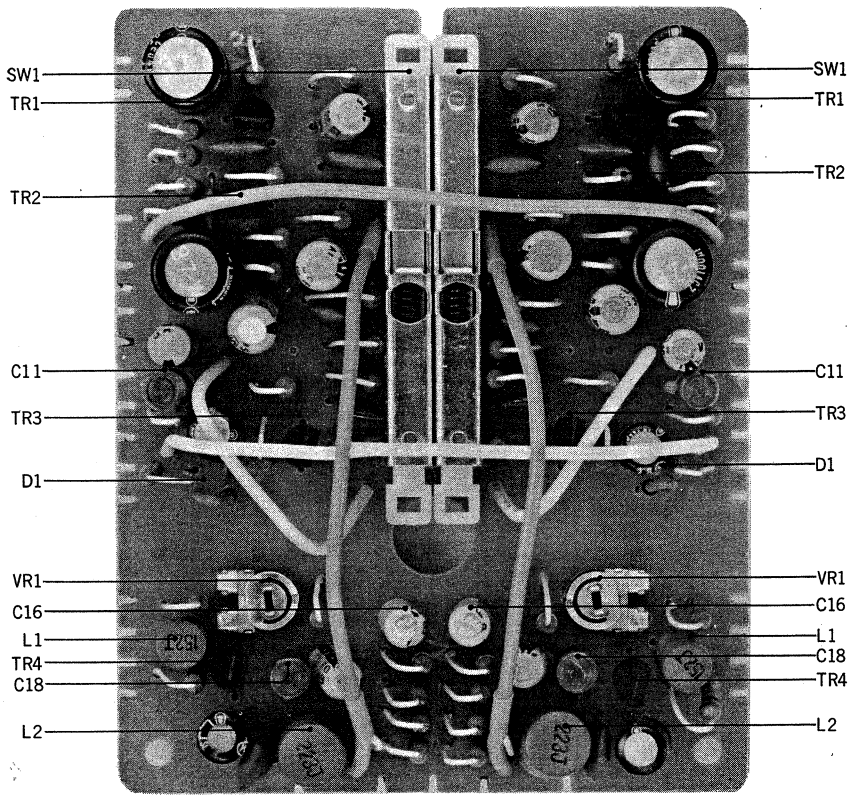
## FIG. 8 PHOTO OF CR P.C. BOARD (MU-1007)




## CR P.C. BOARD (MU-1007) BLOCK

| Symbol No. | Parts No. | Description | Q'ty |
|---|---|---|---|
| 8-1x | BA563556 | CR P.C. Board Comp. (MU-1007) | 1 |
| 8-D1 | ED224550 | Silicon Diode 10D4 | 1 |
| 8-CR1to6 | ER450786 | Spark Quencher U/L 0.1μ+120Ω 400WV | 6 |
| 8-2 | MZ544342 | P.C. Board Holder C | 1 |
| 8-3 | ZS447772 | Tapping Screw #2 3x6(BR) | 2 |
| | | **Capacitor, Tubular Type** | |
| 8-C1 | EC350987 | MP 0.47μF(M) 250VAC | 1 |
| 8-C2, 3 | EC316113 | Elect. 47μF 160WV | 2 |
| | | **Resistor, Wire-wound Type** | |
| 8-R1 | ER554883 | Cement 7W 39(K) | 1 |
| 8-R2 | ER554861 | Cement 10W 250(K) | 1 |
| 8-R3 | ER554905 | Cement 5W 12(K) | 1 |
| 8-R4 | ER565121 | Cement 15W 1.3k(K) (Metal Ox. Film type) | 1 |
| 8-R5 | ER365016 | Carbon RD1/4 220k(J) (Insu. type) | 1 |
| 8-R6 | ER324808 | Carbon RD1/4 100(J) (Insu. type) | 1 |

## FIG. 9 PHOTO OF REC. AMP. P.C. BOARD (MU-5238)

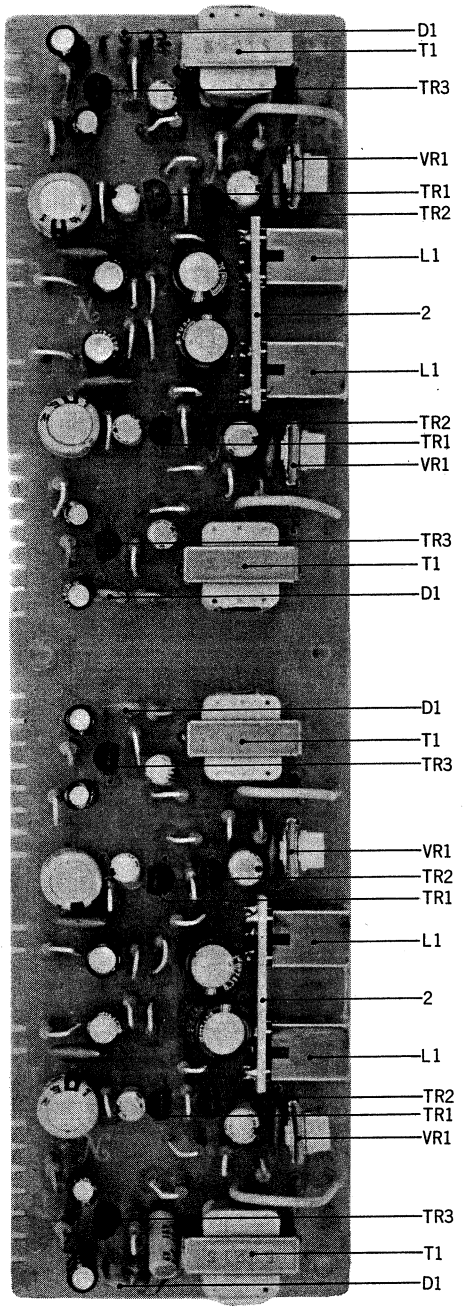



## REC. AMP. P.C. BOARD (MU-5238) BLOCK

| Symbol No. | Parts No. | Description | Q'ty |
|---|---|---|---|
| 9-1x | BA563591 | Rec. Amp. P.C. Board Comp. (MU-5238) | 1 |
| 9-TR1, 2 | ET517263 | Transistor 2SC1312(G) (H) | 4 |
| 9-TR3, 4 | ET453486 | Transistor 2SC711(E) (F) | 4 |
| 9-D1 | ED520762 | Zener Diode YZ-088A | 2 |
| 9-SW1 | ES496642 | Slide SW. CL106B(CL162A25) | 2 |
| 9-VR1 | EV464207 | Semi-fixed Vol. V8K4-1 5 kB | 2 |
| 9-L1 | EO369178 | Ferri Inductor FL7H 1.5MH(J) | 2 |
| 9-L2 | EO244012 | Ferri Inductor FL9H 22MH(J) | 2 |
| | | **Capacitor, Vertical Type** | |
| 9-C1 | EC220678 | Elect. 47μF 25WV | 2 |
| 9-C2 | EC320051 | Elect. 10μF 16WV | 2 |
| 9-C3 | EC451462 | VFM 150PF(J) 50WV | 4 |
| 9-C4 | EC290531 | VFM 100PF(K) 50WV | 2 |
| 9-C5 | EC329771 | Elect. 47μF 6.3WV | 2 |
| 9-C6 | EC357827 | VFM 50PF(K) 50WV | 2 |
| 9-C7 | EC220151 | Elect. 100μF 25WV | 2 |
| 9-C8 | EC320051 | Elect. 10μF 16WV | 2 |
| 9-C9 | EC329771 | Elect. 47μF 6.3WV | 2 |
| 9-C10 | EC399565 | VFM 22PF(J) 50WV | 2 |
| 9-C11 | EC562678 | Styrol 750PF(J) 50WV | 2 |
| 9-C13 | EC250841 | Mylar 0.01μF(J) 50WV | 2 |
| 9-C14 | EC331705 | Elect. 22μF 16WV | 2 |
| 9-C15 | EC320051 | Elect. 10μF 16WV | 2 |
| 9-C16 | EC487157 | NP 0.47μF(M) 50WV | 2 |
| 9-C17 | EC220994 | Elect. 10μF 25WV | 2 |
| 9-C18 | EC516745 | Styrol 330PF(K) 50WV | 2 |
| 9-C19 | EC451462 | VFM 150PF(J) 50WV | 2 |
| 9-C20 | EC435690 | Styrol 560PF(J) 50WV | 2 |

| Symbol No. | Parts No. | Description | Q'ty |
|---|---|---|---|
| | | **Resistor, Stopper Type** | |
| 9-R1 | ER336442 | Carbon RD1/4 10k(J) | 2 |
| 9-R2 | ER362485 | Carbon RD1/4 330k(J) | 2 |
| 9-R3 | ER336442 | Carbon RD1/4 10k(J) | 2 |
| 9-R4 | ER362485 | Carbon RD1/4 330k(J) | 2 |
| 9-R5 | ER212477 | Carbon RD1/4 3.3k(J) | 2 |
| 9-R6 | ER357570 | Carbon RD1/4 150k(J) | 2 |
| 9-R7 | ER343135 | Carbon RD1/4 1.6k(J) | 2 |
| 9-R8 | ER346994 | Carbon RD1/4 18k(J) | 2 |
| 9-R9 | ER343078 | Carbon RD1/4 2.7k(J) | 2 |
| 9-R10 | ER343135 | Carbon RD1/4 1.6k(J) | 2 |
| 9-R11,12 | ER336442 | Carbon RD1/4 10k(J) | 4 |
| 9-R13 | ER399060 | Carbon RD1/4 9.1k(J) | 2 |
| 9-R14 | ER342933 | Carbon RD1/4 27k(J) | 2 |
| 9-R15 | ER357570 | Carbon RD1/4 150k(J) | 2 |
| 9-R16 | ER349828 | Carbon RD1/4 20k(J) | 2 |
| 9-R17 | ER429996 | Carbon RD1/4 470k(J) | 2 |
| 9-R18 | ER212264 | Carbon RD1/4 22k(J) | 2 |
| 9-R19 | ER336442 | Carbon RD1/4 10k(J) | 2 |
| 9-R20,21 | ER212883 | Carbon RD1/4 4.7k(J) | 4 |
| 9-R22 | ER212174 | Carbon RD1/4 180k(J) | 2 |
| 9-R23 | ER336442 | Carbon RD1/4 10k(J) | 2 |
| 9-R24 | ER211858 | Carbon RD1/4 12k(J) | 2 |
| 9-R25 | ER211465 | Carbon RD1/4 1k(J) | 2 |

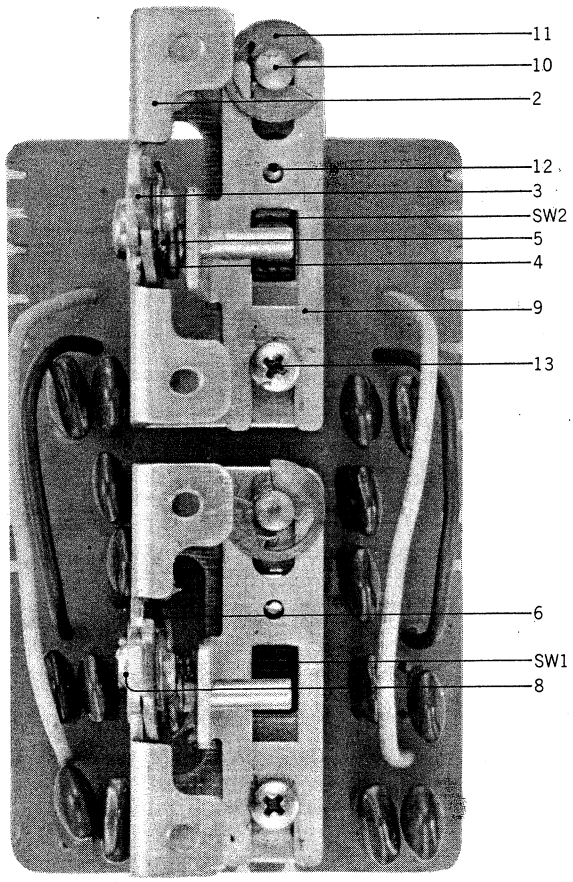
## FIG. 10 PHOTO OF P.B. AMP. P.C. BOARD (MU-5239)



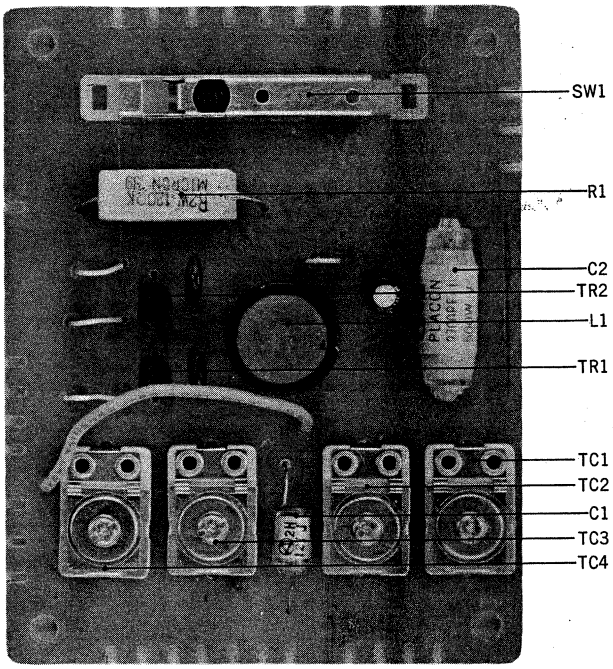

## P.B. AMP. P.C. BOARD (MU-5239) BLOCK

| Symbol No. | Parts No. | Description | Q'ty |
|---|---|---|---|
| 10-1x | BA563602 | P.B. Amp. P.C. Board Comp. (MU-5239) | 1 |
| 10-TR1 | ET517263 | Transistor 2SC1312(G) (H) | 4 |
| 10-TR2, 3 | ET453486 | Transistor 2SC711(E) (F) | 8 |
| 10-D1 | ED219464 | Germanium Diode 1N34A | 4 |
| 10-L1 | EO346230 | Inductor RX 22MH | 4 |
| 10-2 | EA549246 | Coil P.C. Board (MU-5240) | 2 |
| 10-VR1 | EV538402 | Semi-fixed Vol. V10K8-1-5 30 kB(4US) | 4 |
| 10-T1 | BT247768 | Headphone Trans. N19-5921S | 4 |
| | | **Capacitor, Vertical Type** | |
| 10-C1 | EC329850 | VFM 220PF(J) 50WV | 4 |
| 10-C2 | EC320051 | Elect. 10μF 16WV | 4 |
| 10-C3 | EC336126 | Elect. 47μF 25WV | 4 |
| 10-C4 | EC329771 | Elect. 47μF 6.3WV | 4 |
| 10-C5 | EC324516 | Elect. 220μF 6.3WV | 4 |
| 10-C6 | EC451462 | VFM 150PF(J) 50WV | 4 |
| 10-C7 | EC220994 | Elect. 10μF 25WV | 4 |
| 10-C8 | EC250604 | Mylar 0.001μF(K) 50WV | 4 |
| 10-C9 | EC450055 | Elect. 1μF 25WV | 4 |
| 10-C10 | EC320051 | Elect. 10μF 16WV | 4 |
| 10-C11 | EC450527 | Elect. 4.7μF 25WV | 4 |
| | | **Resistor, Stopper Type** | |
| 10-R1 | ER212883 | Carbon RD1/4 4.7k(J) | 4 |
| 10-R2 | ER420322 | Carbon RD1/4 36k(J) | 4 |
| 10-R3 | ER306843 | Carbon RD1/4 1.2k(J) | 4 |
| 10-R4 | ER563455 | Carbon RD1/4 91(J) | 4 |
| 10-R5 | ER357412 | Carbon RD1/4 220(J) | 4 |
| 10-R6 | ER357491 | Carbon RD1/4 82k(J) | 4 |
| 10-R7 | ER357456 | Carbon RD1/4 2.2k(J) | 4 |
| 10-R8 | ER211667 | Carbon RD1/4 100(J) | 4 |
| 10-R9 | ER406912 | Carbon RD1/4 240(J) | 4 |
| 10-R10 | ER211757 | Carbon RD1/4 100k(J) | 4 |
| 10-R11 | ER350100 | Carbon RD1/4 68k(J) | 4 |
| 10-R12 | ER212883 | Carbon RD1/4 4.7k(J) | 4 |
| 10-R13 | ER304402 | Carbon RD1/4 470(J) | 4 |
| 10-R14 | ER212264 | Carbon RD1/4 22k(J) | 4 |

## FIG. 11 PHOTO OF EQ. P.C. BOARD (MU-5241)




## FIG. 12 PHOTO OF OSC. P.C. BOARD (MU-5242)




## EQ. P.C. BOARD (MU-5241) BLOCK

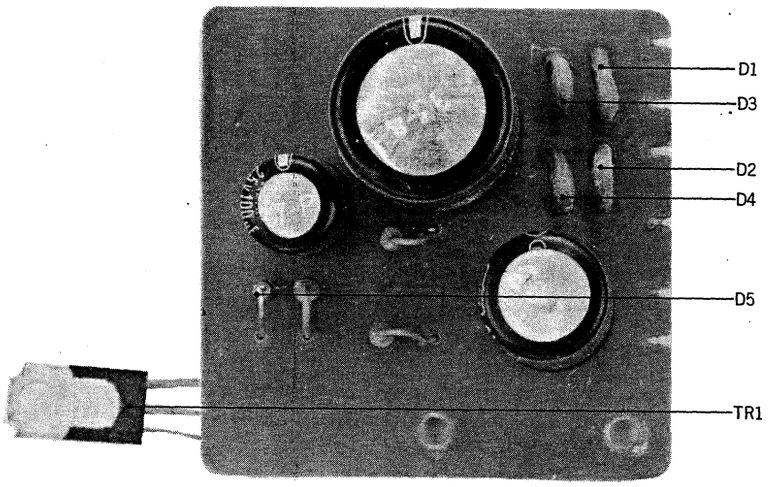
| Symbol No. | Parts No. | Description | Q'ty |
|---|---|---|---|
| 11-1x | BA563613 | Eq. P.C. Board Comp. (MU-5241) | 1 |
| 11-SW1, 2 | ES446117 | Slide SW. SL-282A2 | 2 |
| 11-2 | EZ548357 | Switch Base B | 2 |
| 11-3 | ML549630 | Selector Lever B | 2 |
| 11-4 | ZW322525 | Washer (PBP)D4.1x7x0.2t | 2 |
| 11-5 | ZW270101 | 'E' Ring 3M | 2 |
| 11-6 | ZG548403 | Operation Spring | 2 |
| 11-7x | ZW270088 | 'E' Ring 1.9M | 2 |
| 11-8 | ZS413155 | Screw, binding head 3x6 | 2 |
| 11-9 | EZ548381 | Slider | 2 |
| 11-10 | ZW548370 | Slide Pin B | 2 |
| 11-11 | ZW290283 | 'U' Ring 2.85M | 2 |
| 11-12 | ZS442585 | Screw, binding head 2.6x4 | 2 |
| 11-13 | ZS563444 | Screw, binding head 2.6x8 | 2 |
| | | **Capacitor, Vertical Type** | |
| 11-C1to4 | EC392016 | Mylar 0.068μF(J) 50WV | 4 |
| 11-C5to8 | EC379203 | Mylar 0.039μF(J) 50WV | 4 |
| 11-C9to12 | EC379168 | Mylar 0.033μF(J) 50WV | 4 |
| 11-C13to16 | EC329872 | Mylar 0.027μF(J) 50WV | 4 |

## OSC. P.C. BOARD (MU-5242) BLOCK

| Symbol No. | Parts No. | Description | Q'ty |
|---|---|---|---|
| 12-1x | BA563646 | OSC. P.C. Board Comp. (MU-5242) | 1 |
| 12-TR1, 2 | ET398711 | Transistor 2SC945(Q) (R) | 2 |
| 12-TC1 to 4 | EC558202 | Trimmer/C. TM-80A | 4 |
| 12-L1 | EO383365 | OSC. Coil OT-204 | 1 |
| 12-SW1 | ES494302 | Slide SW. CL-104B | 1 |
| | | **Capacitor, Vertical Type** | |
| 12-C1 | EC563422 | Styrol 120PF(J) 500WV(Tub. type) | 1 |
| 12-C2 | EC435655 | Plastic Film 2700PF(J) 500WV | 1 |
| 12-C3 | EC450055 | Elect. 1μF 25WV | 1 |
| 12-C4, 5 | EC250841 | Mylar 0.01μF(J) 50WV | 2 |
| | | **Resistor, Stopper Type** | |
| 12-R1 | ER466525 | Cement 2W 120(K) (Metal Oxide type) | 1 |
| 12-R2 | ER212883 | Carbon RD1/4 4.7k(J) | 1 |
| 12-R3 | ER304402 | Carbon RD1/4 470(J) | 1 |
| 12-R4, 5 | ER315944 | Carbon RD1/4 3.3(J) | 2 |

When ordering parts, please describe Parts Number, Serial Number, and Model Number in detail.

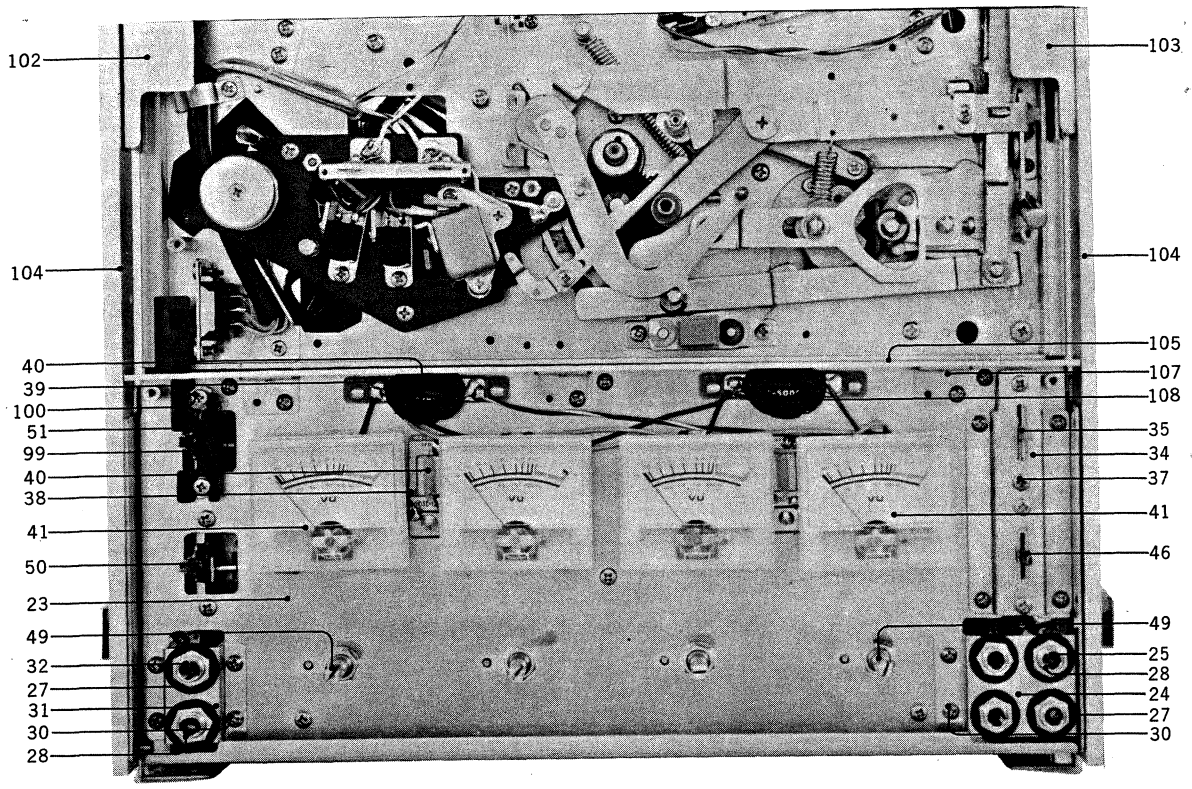
## FIG. 13 PHOTO OF POWER SUPPLY P.C. BOARD (MU-5017)

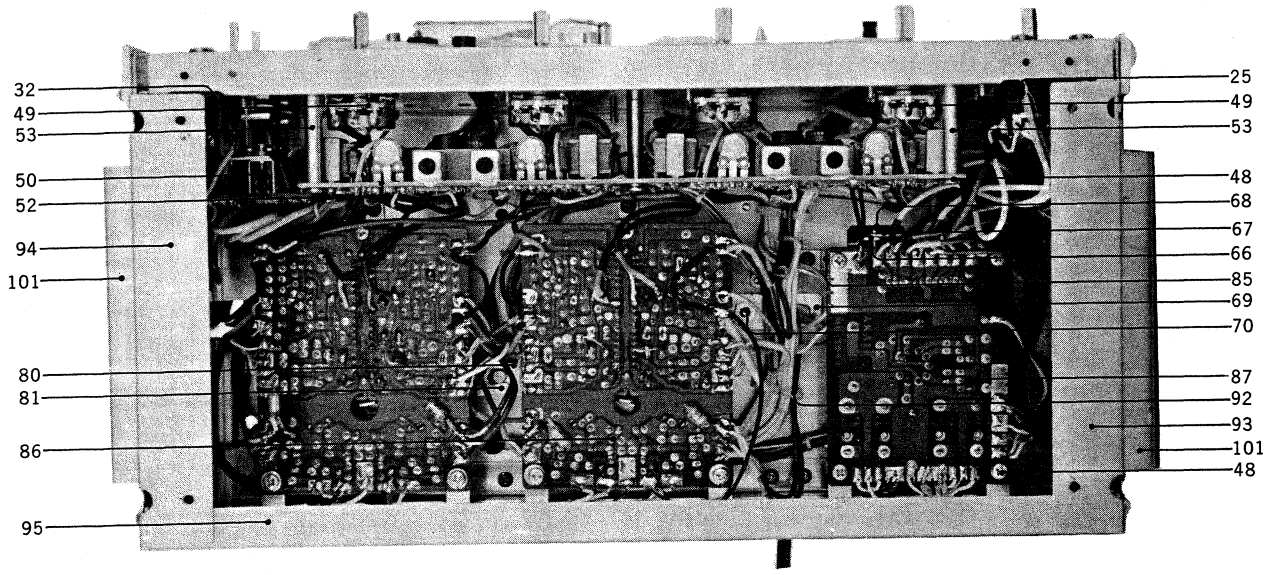



## POWER SUPPLY P.C. BOARD (MU-5017) BLOCK

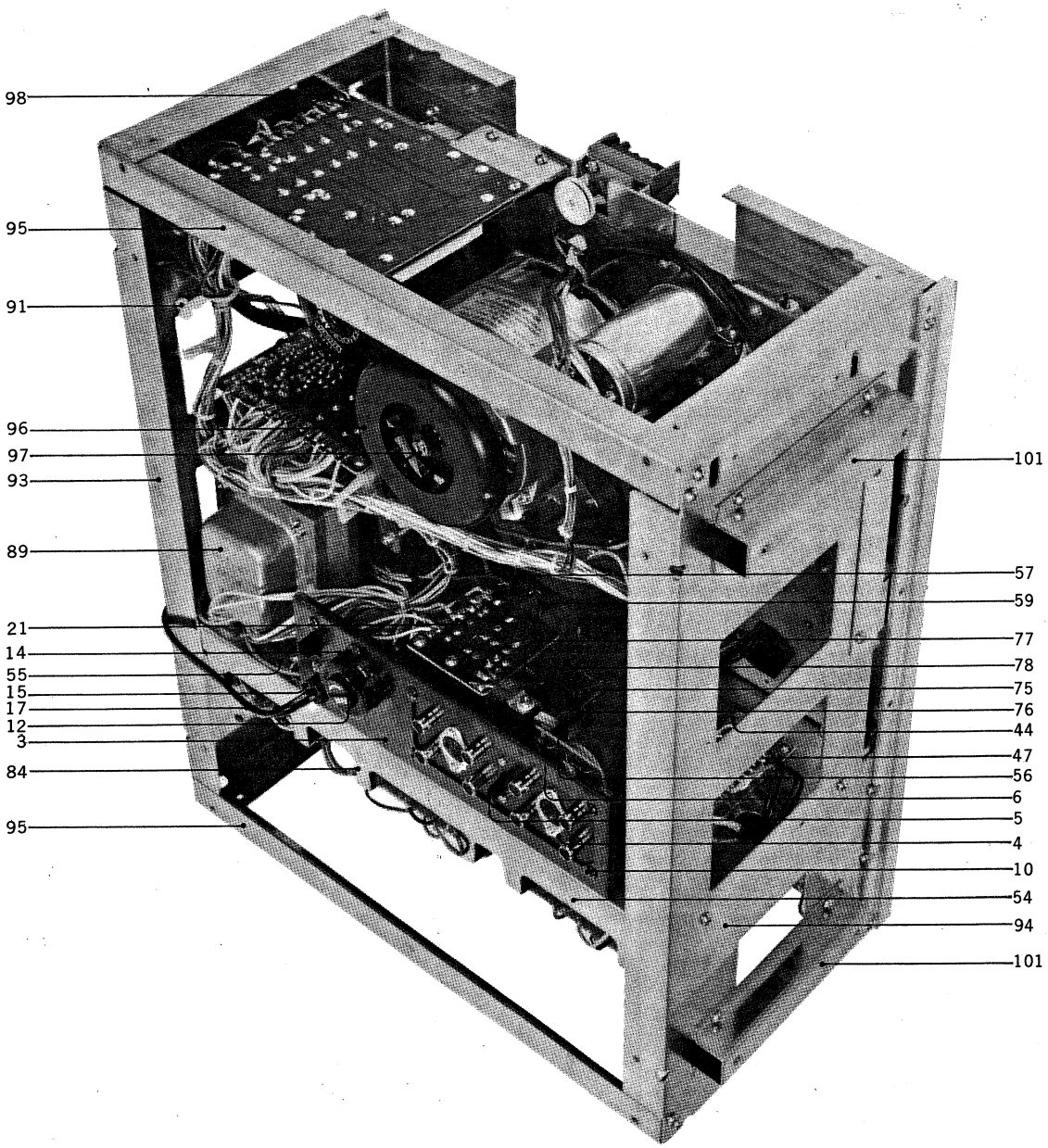
| Symbol No. | Parts No. | Description | Q'ty |
|---|---|---|---|
| 13-1x | BA558450 | Power Supply P.C. Board Comp. (MU-5017) | 1 |
| 13-TR1 | ET495371 | Transistor 2SC1098(L) | 1 |
| 13-D1to4 | ED494583 | Silicon Diode 10D05 | 2 |
| 13-D5 | ED511918 | Zener Diode WZ-240 | 1 |
| 13-2x | ZS323728 | Screw, binding head 3x5 | 1 |
| | | **Capacitor, Vertical Type** | |
| 13-C1 | EC557651 | Elect. 470μF 50WV | 1 |
| 13-C2 | EC220151 | Elect. 100μF 25WV | 1 |
| 13-C3 | EC336115 | Elect. 220μF 25WV | 1 |
| | | **Resistor, Stopper Type** | |
| 13-R1 | ER306843 | Carbon RD1/4 1.2k(J) | 1 |
| 13-R2 | ER211667 | Carbon RD1/4 100(J) | 1 |
| 13-R3 | ER430018 | Carbon RD1/4 1(J) | 1 |

## FIG. 14a PHOTO OF AMPLIFIER ASSEMBLY BLOCK



## FIG. 14b PHOTO OF AMPLIFIER ASSEMBLY BLOCK




## AMPLIFIER ASSEMBLY BLOCK

| Ref. No. | Parts No. | Description | Schematic No. | Q'ty |
|---|---|---|---|---|
| | | JACK PLATE BLOCK | | |
| 14-1x | BZ563624 | Jack Plate Block Comp. | MU-2 | 1 |
| 14-2x | BZ563635 | Jack Plate Block Comp. (3 core) | MU-2 | 1 |
| 14-3 | EZ548741 | Jack Plate Bracket | MU-5231 | 1 |
| 14-4 | EJ563433 | Jack Plate MU-2 (w/jack) | 31-5-86 | 1 |
| 14-5 | ES446973 | Slide SW. SL-242B4D | 25-3-51 | 1 |
| 14-6 | EA549270 | Jack P.C. Board | MU-5237 | 1 |
| 14-7x | ER589375 | Carbon/R. RD1/4 680k(J) (Insu. type) | 35-9-10 | 4 |
| 14-8x | ER558573 | Carbon/R. RD1/4 27k(J) (Insu. type) | 35-9-10 | 4 |
| 14-9x | ER368133 | Carbon/R. RD1/4 22k(J) (Insu. type) | 35-9-10 | 8 |
| 14-10 | ZS201183 | Screw, truss head 3x8(black) | | 4 |
| 14-11x | ZW273756 | Nut M3 | | 4 |

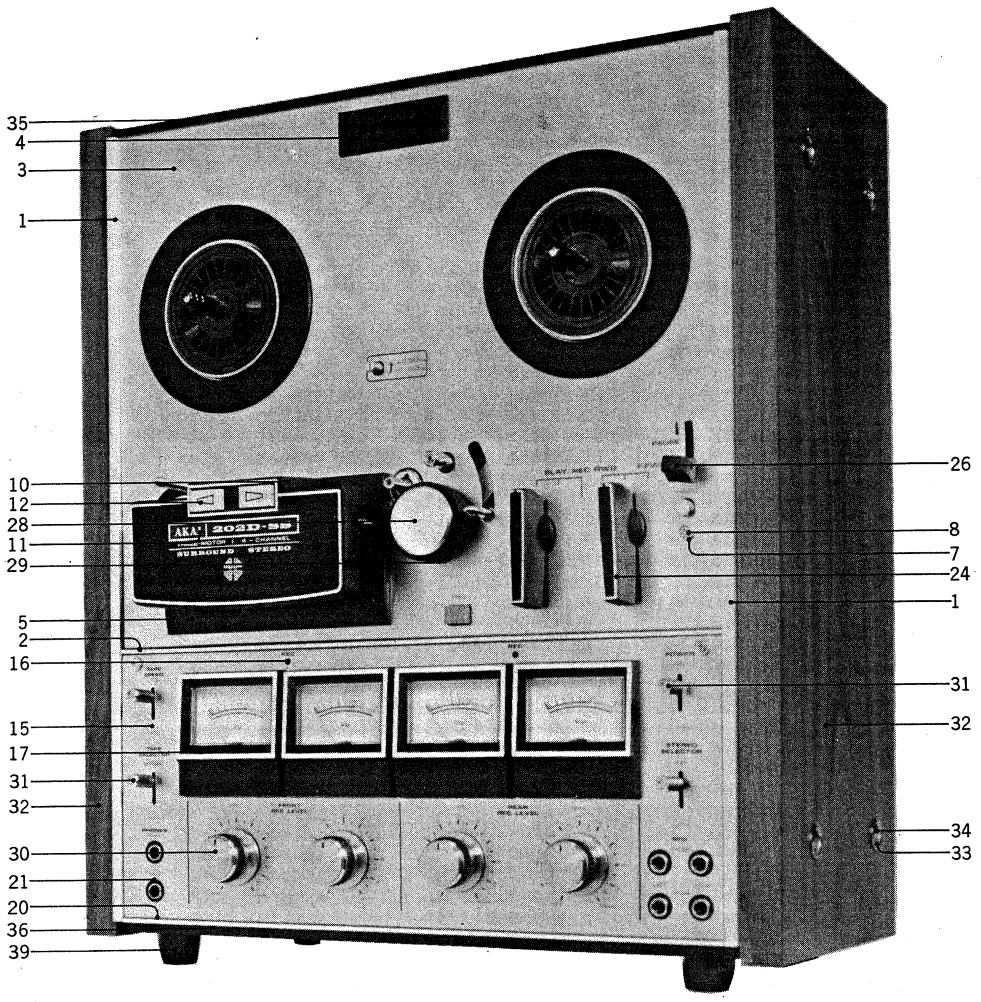
| Ref. No. | Parts No. | Description | Schematic No. | Q'ty |
|---|---|---|---|---|
| 14-12 | EJ233370 | Socket (Volt. Selector) S-18010 | 40-2-3 | 1 |
| 14-13x | EF558066 | Fuse 2A 125V | 39-1-47 | 1 |
| 14-14 | ZS372025 | ISO Screw, truss head 3x6 | | 2 |
| 14-15 | EZ382263 | Strain Relief SR-4K-4 | 2-7-12 | 1 |
| 14-16x | EZ246936 | Strain Relief SR-6W-1 (WG, 3 core) | 2-7-8 | 1 |
| 14-17 | EW540112 | AC Cord (CUL) 2.5M | 26-3-19 | 1 |
| 14-18x | EW315448 | Australia Cord (3 core) | 26-3-11 | 1 |
| 14-19x | EW524845 | AC Cord (J) 2.5M | 26-3-31 | 1 |
| 14-20x | ZW273778 | Earth Lug M3 | | 1 |
| 14-21 | BA558450 | Power Supply P.C. Board Comp. (MU-5017) | | 1 |
| 14-22x | ZS447772 | Tapping Screw #2 3x6(BR). | | 2 |

**When ordering parts, please describe Parts Number, Serial Number, and Model Number in detail.**

| Ref. No. | Parts No. | Description | Schematic No. | Q'ty |
|---|---|---|---|---|
| | | **AMP. ASSEMBLY BLOCK** | | |
| 14-23 | EZ548908 | Amp. Plate, w/stand | MU-5201 | 1 |
| 14-24 | EZ548313 | Jack Base A | MU-5203 | 1 |
| 14-25 | EJ448075 | Mic. Jack 2PMJ1 | 31-2-23 | 4 |
| 14-26x | EZ225180 | Nylon Collar, Jack | LD-520 | 4 |
| 14-27 | ZW260368 | Washer (Fiber)D9.2x18x0.5t | | 6 |
| 14-28 | ZW554624 | Nut, E Jack | 7-1-56 | 6 |
| 14-29x | ER315213 | Carbon/R. RD1/4 8.2k(J) (Insu. type) | 35-9-5 | 4 |
| 14-30 | ZS447772 | Tapping Screw #2 3x6(BR) | | 52 |
| 14-31 | EZ548324 | Jack Base B | MU-5204 | 1 |
| 14-32 | EJ447603 | Mic. Jack 3PMJ1 | 31-2-24 | 2 |
| 14-33x | ZW272722 | Toothed Lock Washer M9 D9.3x13x0.5t | | 2 |
| 14-34 | EZ548302 | SW. Base | MU-5202 | 1 |
| 14-35 | ES436983 | Lever SW. SDD2LCPO (LPS60112CPOO) | 25-4-9 | 1 |
| 14-36x | ER450797 | Spark Quencher U/L 0.033μ+120Ω 400WV | 41-1-34 | 1 |
| 14-37 | ZS379405 | ISO Screw, binding head 3x6 | | 4 |
| 14-38 | EA476256 | Lamp P.C. Board | MR-5004 | 2 |
| 14-39 | EA449414 | Lamp P.C. Board | BS-5005 | 2 |
| 14-40 | EL295312 | Lamp (No. 2) 8V 0.2A | 28-2-8 | 4 |
| 14-41 | EM558180 | VU Meter KL-243S-5 | 46-1-74 | 4 |
| 14-42x | EZ449471 | VU Mat | BS-5010 | 4 |
| 14-43x | EJ293073 | Mate-N-Lock Plug Housing 12P 1-480275-0 | 52-1-1 | 1 |
| 14-44 | EJ430378 | Multi-jack 14P 3252-014-001 | 31-4-14 | 1 |
| 14-45x | EJ373634 | Socket Contact 61115-1 | 52-1-1 | 12 |
| 14-46 | ES443013 | Lever SW. SQ11 12-4-2 Black(M) | 25-12-3 | 1 |
| 14-47 | EZ548414 | Jack Metal Parts | MU-5215 | 1 |
| 14-48 | ZS413155 | Screw, binding head 3x6 | | 25 |
| 14-49 | EV476223 | Volume V24N 50 kA | 36-2-26 | 4 |
| 14-50 | BA563613 | EQ. P.C. Board Comp. (MU-5241) | | 1 |
| 14-51 | MH548335 | Slide Prop | MU-5206 | 2 |
| 14-52 | BA563602 | P.B. Amp. P.C. Board Comp. (MU-5239) | | 1 |
| 14-53 | EZ548583 | P.C. Board Stand C | MU-5236 | 3 |
| 14-54 | EZ548910 | Amp. Chassis | MU-5214 | 1 |
| 14-55 | EZ548572 | Amp. Chassis Reinforcement Plate | MU-5235 | 1 |
| 14-56 | ES563387 | Leaf SW. BSW-1A | 25-10-19 | 1 |
| 14-57 | EP563398 | Plunger Solenoid 0730THTI-3 | 44-1-64 | 1 |
| 14-58x | ED224548 | Silicon Diode 10D2 | 45-2-14 | 1 |
| 14-59 | EZ548504 | Plunger Base | MU-5224 | 1 |
| 14-60x | ZS442585 | Screw, binding head 2.6x4 | | 2 |
| 14-61x | EZ548515 | Pull Plate | MU-5225 | 1 |
| 14-62x | ZW548548 | Pin | MU-5228 | 1 |
| 14-63x | ZW357164 | 'E' Ring 2.3M | 6-1-9 | 1 |
| 14-64x | UM494414 | Joint Pin | CG-1206 | 1 |
| 14-65x | ZW270088 | 'E' Ring 1.9M | 6-1-9 | 3 |
| 14-66 | EZ548550 | Lever Mt. Plate | MU-5229 | 1 |
| 14-67 | ML548526 | Lever, w/plate | MU-5226 | 1 |
| 14-68 | EZ548561 | Lever Shaft | MU-5230 | 1 |
| 14-69 | ML548458 | R Lever | MU-5219 | 1 |
| 14-70 | MH314280 | Rec. Lever Pin | MR-528 | 1 |
| 14-71x | ZW273892 | Toothed Lock Washer M4 | | 1 |
| 14-72x | ZW416698 | Nut M4 | | 1 |
| 14-73x | ZS314717 | Graduated Screw, MR | MR-254 | 2 |
| 14-74x | ZW273756 | Nut M3 | | 6 |
| 14-75 | ML548436 | Rec. Lever | MU-5217 | 1 |
| 14-76 | ZS207314 | Amp. Lever Set Screw | 3A-737 | 2 |
| 14-77 | ZG548447 | Rec. Spring | MU-5218 | 1 |
| 14-78 | ZG431291 | Slide Spring | ED-B108 | 1 |
| 14-79x | ZW273778 | Earth Lug M3 | | 1 |
| 14-80 | ML548460 | R Lever A, w/pin | MU-5220 | 1 |
| 14-81 | ML548482 | R Lever B | MU-5222 | 1 |
| 14-82x | ZW290283 | 'U' Ring 2.85M | 6-1-1 | 2 |
| 14-83x | MH548493 | R Prop | MU-5223 | 2 |
| 14-84 | EZ548730 | P.C. Board Stand A | MU-5205 | 1 |
| 14-85 | EZ548425 | P.C. Board Stand B | MU-5216 | 4 |
| 14-86 | BA563591 | Rec. Amp. P.C. Board Comp. (MU-5238) | | 2 |
| 14-87 | BA563646 | OSC. P.C. Board Comp. (MU-5242) | | 1 |
| 14-88x | UM388348 | Power Supply Trans. Shield Plate, CSA | CS-5016 | 1 |
| 14-89 | BT563411 | Power Trans. MUT-4 | 38-4-263 | 1 |
| 14-90x | ZS462925 | Tapping Screw #2 4x8(BR) | | 4 |
| 14-91 | EJ514607 | Wire Clip 220-JD485210-01 (Nylon) | 2-7-18 | 2 |
| 14-92 | EJ510333 | Wire Clip 220-JD481610-0104 (Nylon) | 2-7-17 | 4 |
| 14-93 | EZ548965 | Side Chassis R, w/angle | MU-5232 | 1 |
| 14-94 | EZ548976 | Side Chassis L, w/angle | MU-5232 | 1 |
| 14-95 | EZ548763 | Reinforcement Angle | MU-5234 | 2 |
| 14-96 | SZ529108 | Main Motor Fan | ND-7010 | 1 |
| 14-97 | ZW270134 | 'E' Ring 5M | 6-1-9 | 1 |
| 14-98 | SZ544476 | P.C. Board Holder D | MU-6016 | 1 |
| 14-99 | SZ548594 | Coupling Plate | MU-6201 | 1 |
| 14-100 | ZS425981 | Screw, binding head 3x3 | | 2 |
| 14-101 | SZ548605 | Side Plate Support | MU-6202 | 4 |
| 14-102 | SZ544465 | Reinforcement Plate L | MU-6015 | 1 |
| 14-103 | SZ544691 | Reinforcement Plate R | MU-6015 | 1 |
| 14-104 | SE548921 | Sash | MU-6205 | 2 |
| 14-105 | SE548774 | Sash B | MU-6204 | 1 |
| 14-106x | ZS200384 | Screw, countersunk head 3x6 | | 3 |
| 14-107 | SZ548616 | Sash Bracket | MU-6203 | 3 |
| 14-108 | UM494267 | Lamp Cover | CG-2206 | 2 |

**When ordering parts, please describe Parts Number, Serial Number, and Model Number in detail.**

## FIG. 15 PHOTO OF FINAL ASSEMBLY BLOCK




## FINAL ASSEMBLY BLOCK

| Ref. No. | Parts No. | Description | Schematic No. | Q'ty |
|---|---|---|---|---|
| 15-1 | SE548921 | Sash | MU-6205 | 2 |
| 15-2 | SE548774 | Sash B | MU-6204 | 1 |
| 15-3 | SP548932 | Mech. Panel A, w/ring | MU-6206 | 1 |
| 15-4 | SE528906 | Counter Escutcheon | ND-6008 | 1 |
| 15-5 | SC544533 | Head Cover Base | MU-6003 | 1 |
| 15-6x | ZS413155 | Screw, binding head 3x6 | | 4 |
| 15-7 | ZW408418 | Panel Washer | KD-6029 | 4 |
| 15-8 | ZS563308 | Screw, oval countersunk head 3x6 | | 4 |
| 15-9x | HZ579126 | Head Shield Plate | MU-6228 | 1 |
| 15-10 | SC544544 | Head Cover | MU-6004 | 1 |
| 15-11 | SM548673 | Head Cover Name Plate | MU-6220 | 1 |
| 15-12 | SB544454 | Direction Button | MU-6006 | 2 |
| 15-13x | ZS355511 | Screw, binding head 3x6(black) | | 2 |
| 15-14x | ZS325495 | Tapping Screw #2 3x6 | | 5 |
| 15-15 | SP548954 | Amp. Panel | MU-6208 | 1 |
| 15-16 | SZ457975 | Lamp Lens B (Red) | 55-5012 | 2 |
| 15-17 | SE544601 | VU Meter Escutcheon | MU-6017 | 4 |
| 15-18x | SZ548897 | Escutcheon Support | MU-6221 | 4 |
| 15-19x | ZS425788 | Screw, round head 3x4 | | 8 |
| 15-20 | SE548785 | Sash C | MU-6210 | 1 |
| 15-21 | ZW526577 | Collar B, Jack | MC-5006 | 6 |
| 15-22x | ZS447772 | Tapping Screw #2 3x6(BR) | | 2 |
| 15-23x | ZW432347 | Washer (Luminar) D6.2x13x0.125t | | 2 |
| 15-24 | SK476684 | Mech. Knob | LE-6018 | 2 |
| 15-25x | ZS253405 | Mech. Knob Screw | 7-1-46 | 2 |
| 15-26 | SK314100 | Pause Knob B | MR-612 | 1 |
| 15-27x | ZS356804 | Set Screw, hexagon socket 3x4(cup) | | 1 |
| 15-28 | SK425158 | Pinch Roller Cap | MS-6020 | 1 |
| 15-29 | MP271170 | Pinch Roller, LC D=38 | LC-321 | 1 |
| 15-30 | SK548662 | Volume Knob Comp. | MU-6219 | 4 |
| 15-31 | SK442765 | Lever SW. Knob A-1 | 81-5603 | 4 |
| 15-32 | BC548796 | Side Plate | MU-6211 | 2 |
| 15-33 | ZW548010 | Spot Facing Washer | MU-6028 | 8 |
| 15-34 | ZS563321 | Screw, binding head 4x14 | | 8 |
| 15-35 | SP548807 | Upper Plate | MU-6212 | 1 |
| 15-36 | SP548818 | Lower Plate | MU-6212 | 1 |
| 15-37x | ZW461610 | Decorative Washer 3M | | 4 |
| 15-38x | ZS482815 | Screw, oval countersunk head 3x8 | | 4 |
| 15-39 | SA377190 | Rubber Foot, LM | LM-404 | 8 |
| 15-40x | ZW419646 | Washer (SPC)D4.5x9.8x0.5t | | 8 |
| 15-41x | ZS487776 | Screw, truss head 4x18 | | 8 |
| 15-42x | SP548820 | Back Plate A | MU-6213 | 1 |
| 15-43x | ZS498273 | Tapping Screw #2 3x8, w/washer | | 2 |
| 15-44x | EF304626 | Fuse ST-4 1A | 39-1-28 | 1 |
| 15-45x | EF558066 | Fuse 2A 125V | 39-1-47 | 1 |

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| BA558450 | 14-21 | EC451462 | 9-C19 | ER336442 | 7-R20 | EZ548425 | 14-85 | ML396810 | 6-88x |
| BA563556 | 8-1x | EC451462 | 10-C6 | ER336442 | 9-R1 | EZ548504 | 14-59 | ML540990 | 3-12 |
| BA563567 | 7-1x | EC487157 | 9-C16 | ER336442 | 9-R3 | EZ548515 | 14-61x | ML541001 | 3-13 |
| BA563591 | 9-1x | EC516745 | 9-C18 | ER336442 | 9-R11,12 | EZ548550 | 14-66 | ML544285 | 1-49 |
| BA563591 | 14-86 | EC520626 | 6-41 | ER336442 | 9-R19 | EZ548561 | 14-68 | ML544307 | 6-123 |
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| BA563602 | 14-52 | EC558202 | 12-TC1to4 | ER342933 | 7-R19 | EZ548583 | 14-53 | ML548458 | 14-69 |
| BA563613 | 11-1x | EC562678 | 9-C11 | ER342933 | 9-R14 | EZ548730 | 14-84 | ML548460 | 14-80 |
| BA563613 | 14-50 | EC563422 | 12-C1 | ER343078 | 9-R9 | EZ548741 | 14-3 | ML548482 | 14-81 |
| BA563646 | 12-1x | ED219464 | 7-D3 | ER343135 | 9-R7 | EZ548763 | 14-95 | ML548526 | 14-67 |
| BA563646 | 14-87 | ED219464 | 10-D1 | ER343135 | 9-R10 | EZ548908 | 14-23 | ML549213 | 6-86 |
| BC548796 | 15-32 | ED224548 | 14-58x | ER346994 | 9-R8 | EZ548910 | 14-54 | ML549630 | 11-3 |
| BF476550 | 4-1x | ED224550 | 8-D1 | ER349828 | 9-R16 | EZ548965 | 14-93 | MP271170 | 6-118x |
| BH563545 | 1-1x | ED494583 | 13-D1to4 | ER350100 | 10-R11 | EZ548976 | 14-94 | MP271170 | 15-29 |
| BL204480 | 5-29x | ED511918 | 13-D5 | ER357412 | 10-R5 | HA445116 | 1-17 | MR217203 | 5-31 |
| BL316484 | 6-115 | ED514721 | 7-D5, 6 | ER357456 | 7-R9 | HE552914 | 1-12 | MR269730 | 5-12 |
| BL555344 | 3-11x | ED520762 | 9-D1 | ER357456 | 7-R14 | HE563220 | 1-15 | MR269763 | 6-81 |
| BM314741 | 2-1 | ED536062 | 7-D4 | ER357456 | 10-R7 | HL541157 | 1-58 | MR314785 | 6-61 |
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| BZ558347 | 6-1x | EJ233370 | 14-12 | ER399060 | 9-R13 | HZ317597 | 1-8 | MS317362 | 6-24 |
| BZ563624 | 14-1x | EJ293073 | 14-43x | ER406912 | 10-R9 | HZ317632 | 1-30 | MS342000 | 2-6 |
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| SK442765 | 15-31 | ZS413155 | 11-8 | ZW273756 | 4-27x | | | | |
| SK476684 | 15-24 | ZS413155 | 14-48 | ZW273756 | 5-5x | | | | |
| SK543857 | 6-10 | ZS413155 | 15-6x | ZW273756 | 6-49x | | | | |
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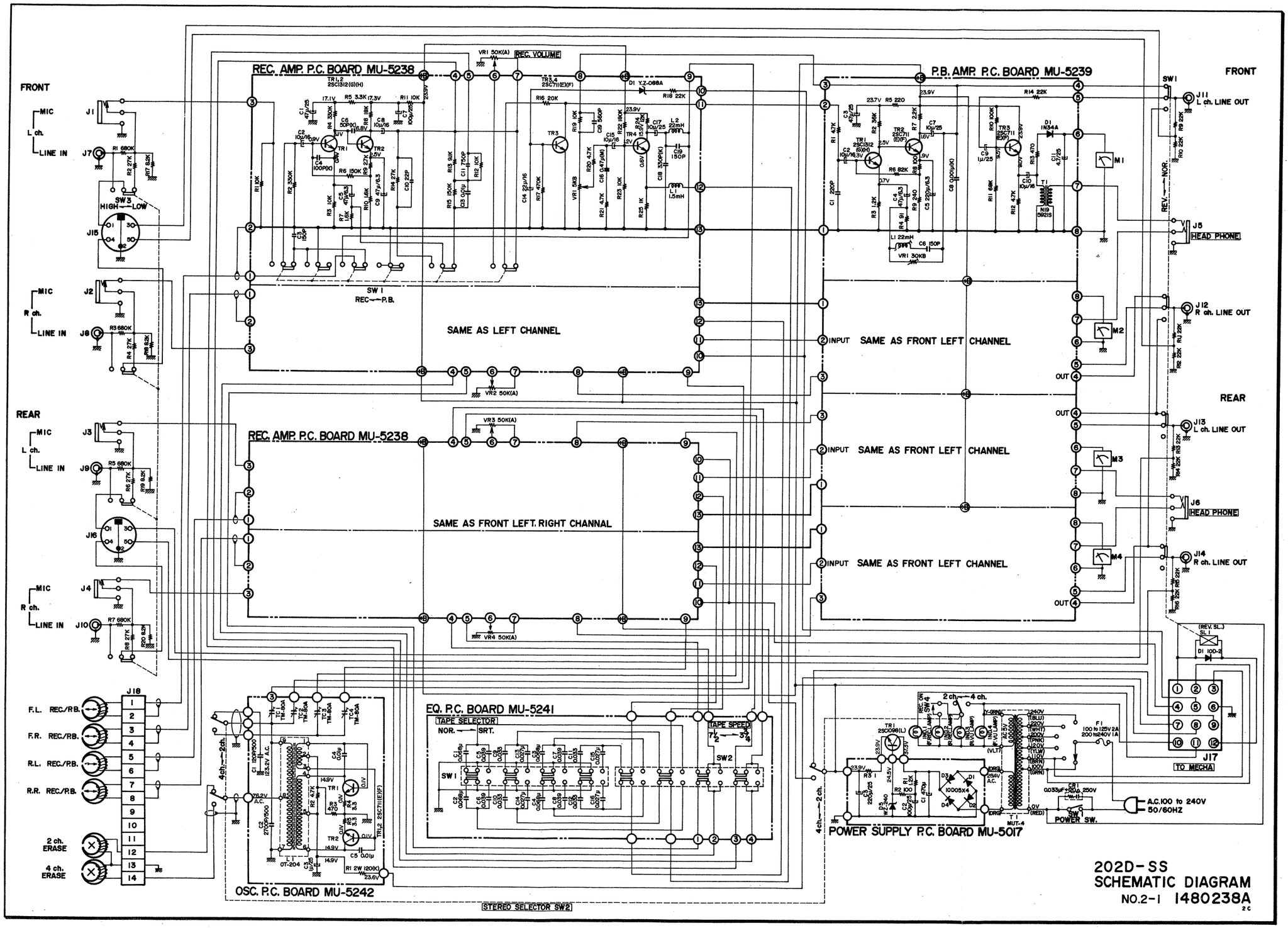
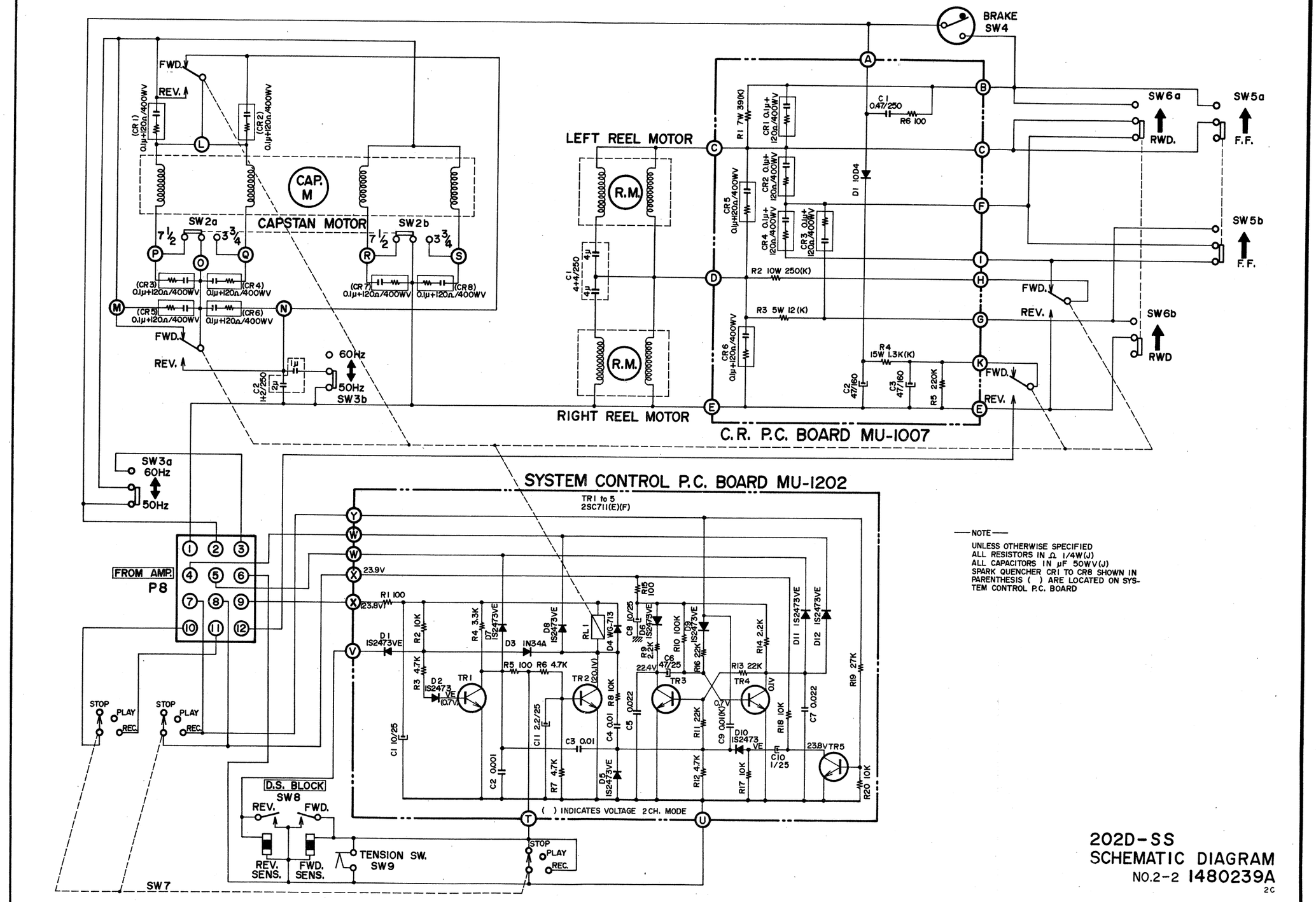
| ZG314706 | 6-46 | ZS437545 | 5-34 | ZW330412 | 6-55x | | | | |
| ZG314818 | 6-63 | ZS439514 | 4-26x | ZW330423 | 6-56x | | | | |
| ZG315011 | 2-29 | ZS442585 | 11-12 | ZW330434 | 6-57x | | | | |
| ZG315011 | 6-94 | ZS442585 | 14-60x | ZW330445 | 6-58x | | | | |
| ZG316732 | 6-5 | ZS444273 | 6-122 | ZW357164 | 14-63x | | | | |
| ZG316765 | 6-12 | ZS447772 | 7-3 | ZW364803 | 1-37 | | | | |
| ZG317114 | 1-36 | ZS447772 | 8-3 | ZW376402 | 5-11x | | | | |
| ZG317496 | 2-15 | ZS447772 | 14-22x | ZW392681 | 4-12 | | | | |
| ZG317777 | 1-60 | ZS447772 | 14-30 | ZW393232 | 4-18 | | | | |
| ZG396538 | 1-24 | ZS447772 | 15-22x | ZW408418 | 15-7 | | | | |
| ZG431291 | 14-78 | ZS455231 | 1-26 | ZW413267 | 6-32x | | | | |
| ZG437253 | 6-19 | ZS462925 | 14-90x | ZW413278 | 6-26x | | | | |
| ZG455692 | 6-83 | ZS464692 | 1-54 | ZW413280 | 4-17 | | | | |
| ZG548403 | 11-6 | ZS482815 | 15-38x | ZW413998 | 4-19 | | | | |
| ZG548447 | 14-77 | ZS487776 | 15-41x | ZW416698 | 2-21x | | | | |
| ZS200384 | 1-9x | ZS498273 | 15-43x | ZW416698 | 4-24x | | | | |
| ZS200384 | 14-106x | ZS554916 | 1-47 | ZW416698 | 5-25 | | | | |
| ZS201183 | 14-10 | ZS554962 | 1-34 | ZW416698 | 6-30x | | | | |
| ZS201475 | 1-13 | ZS558101 | 1-61 | ZW416698 | 6-80 | | | | |
| ZS201508 | 1-22 | ZS558134 | 1-48 | ZW416698 | 14-72x | | | | |
| ZS202116 | 6-72 | ZS559045 | 5-20x | ZW419646 | 6-11 | | | | |
| ZS203016 | 3-19 | ZS563308 | 15-8 | ZW419646 | 15-40x | | | | |
| ZS207314 | 6-69x | ZS563321 | 15-34 | ZW419826 | 6-66 | | | | |
| ZS207314 | 6-109 | ZS563332 | 6-111x | ZW432347 | 6-48x | | | | |
| ZS217877 | 6-105 | ZS563444 | 11-13 | ZW432347 | 15-23x | | | | |
| ZS207314 | 14-76 | ZW231805 | 1-40 | ZW432944 | 6-8 | | | | |
| ZS253405 | 15-25x | ZW259705 | 6-68x | ZW447208 | 4-4 | | | | |
| ZS272395 | 3-9 | ZW259885 | 6-70x | ZW461610 | 15-37x | | | | |
| ZS314717 | 6-47 | ZW259942 | 5-10x | ZW526577 | 15-21 | | | | |
| ZS314717 | 14-73x | ZW259975 | 6-79x | ZW548010 | 15-33 | | | | |
| ZS323728 | 2-31x | ZW260010 | 6-108x | ZW548370 | 11-10 | | | | |
| ZS323728 | 5-26x | ZW260054 | 3-17x | ZW548548 | 14-62x | | | | |
| ZS323728 | 6-37 | ZW260054 | 6-130 | ZW554624 | 14-28 | | | | |

SECTION 3

# SCHEMATIC DIAGRAM

## 1. 202D-SS SCHEMATIC DIAGRAM


REC. AMP. P.C. BOARD MU-5238
REC. VOLUME
VR1 50K(A)
FRONT
MIC
L ch.
LINE IN
J1
J7
MIC
R ch.
LINE IN
J2
J8
SW3
HIGH — LOW
J15
SW1
REC — P.B.
SAME AS LEFT CHANNEL
VR2 50K(A)
REAR
MIC
L ch.
LINE IN
J3
J9
J16
MIC
R ch.
LINE IN
J4
J10
REC. AMP. P.C. BOARD MU-5238
VR3 50K(A)
SAME AS FRONT LEFT. RIGHT CHANNAL
VR4 50K(A)
P.B. AMP. P.C. BOARD MU-5239
SAME AS FRONT LEFT CHANNEL
SAME AS FRONT LEFT CHANNEL
SAME AS FRONT LEFT CHANNEL
FRONT
REAR
REV. — NOR.
J11
L ch. LINE OUT
J5
HEAD PHONE
J12
R ch. LINE OUT
J13
L ch. LINE OUT
J6
HEAD PHONE
J14
R ch. LINE OUT
M1
M2
M3
M4
J18
F.L. REC./P.B.
F.R. REC./P.B.
R.L. REC./P.B.
R.R. REC./P.B.
2 ch. ERASE
4 ch. ERASE
OSC. P.C. BOARD MU-5242
4ch. — 2ch.
EQ. P.C. BOARD MU-5241
TAPE SELECTOR
NOR. SRT.
TAPE SPEED
SW1
SW2
STEREO SELECTOR SW2
POWER SUPPLY P.C. BOARD MU-5017
2 ch. 4 ch.
4ch. — 2ch.
SW4
SW1
POWER SW.
J17
TO MECHA
(REV. SL.)
A.C.100 to 240V
50/60HZ
202D-SS
SCHEMATIC DIAGRAM
NO.2-1 1480238A
2C




# 202D-SS
## SCHEMATIC DIAGRAM
NO.2-2 1480239A
2C